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Gray-Iron Foundry of Instructive Design

Advantages of a Clean and Orderly Operation as Maintained by the Textile Machine Company, Reading, Pa.—Bonus System and Other Benefits

It too often happens that foundries which are well designed and expensively equipped for maximum production and for the comfort of employees, are not what they should be in productivity, neatness, healthfulness or safety, for the reason that there has been an almost ignominious surrender to an at least implied sentiment that "a foundry is a dirty place." As a result of this feeling and the

a building of generous size built for the exclusive use of the molders and foundry workers. It is the molders' bathroom; but it is more than a place for washing up, as it contains substantial tables and benches for the use of the men at noon-time. The illustrations herewith bespeak the precise order which is maintained. One man who was picked for his faculty of preserving discipline has charge of



Office of the Foundry Superintendent of the Textile Machine Company, Reading, Pa. This Room Adjoins the Foundry

consequent lack of persistent regulation, there are dirt and disorder, with an impairment of original plans, harmful to employer and employee alike. Both suffer and both are to blame.

The opposite of the conditions alluded to is so far exemplified in the foundry of the Textile Machinery Company, Reading, Pa., that even the casual visitor would be impressed with the neatness and order of the plant, an all-round excellence which has been created by close attention to detail.

On approaching the foundry from the main gate to the company's grounds attention is attracted to

the room, and woe to the molder who is caught committing an offensive act. The room contains 24 wash basins of white vitreous ware, eight shower baths, 200 lockers and racks for drying the clothing. The latter may be raised to the high ceiling by a pulley arrangement, thereby being not only lifted out of the way but to the part of the room where the temperature is highest, so that drying is more quickly accomplished. The floor is of concrete and between the rows of lockers are benches for the convenience of the men. The bases of all the benches and tables are of cast iron. Sanitary fountains



The Shower Baths and Wash Basins. To the Right May Be Seen the Apparatus for Heating Water and the Entrance to the Passage between the Bathroom and Foundry. The Foundry Office Faces the Corridor

supply water not only in the bathroom but throughout the plant.

When leaving the foundry on their way to the bathroom the men pass through a corridor in which are time clocks on which they register. If quitting

for the day, they leave the bathroom by a door at the opposite end of the room. The room is open from 6 to 7 a.m., from 11:50 a.m. to 1 p.m. and from 2:30 to 7 p.m.

The office of the foundry superintendent is a



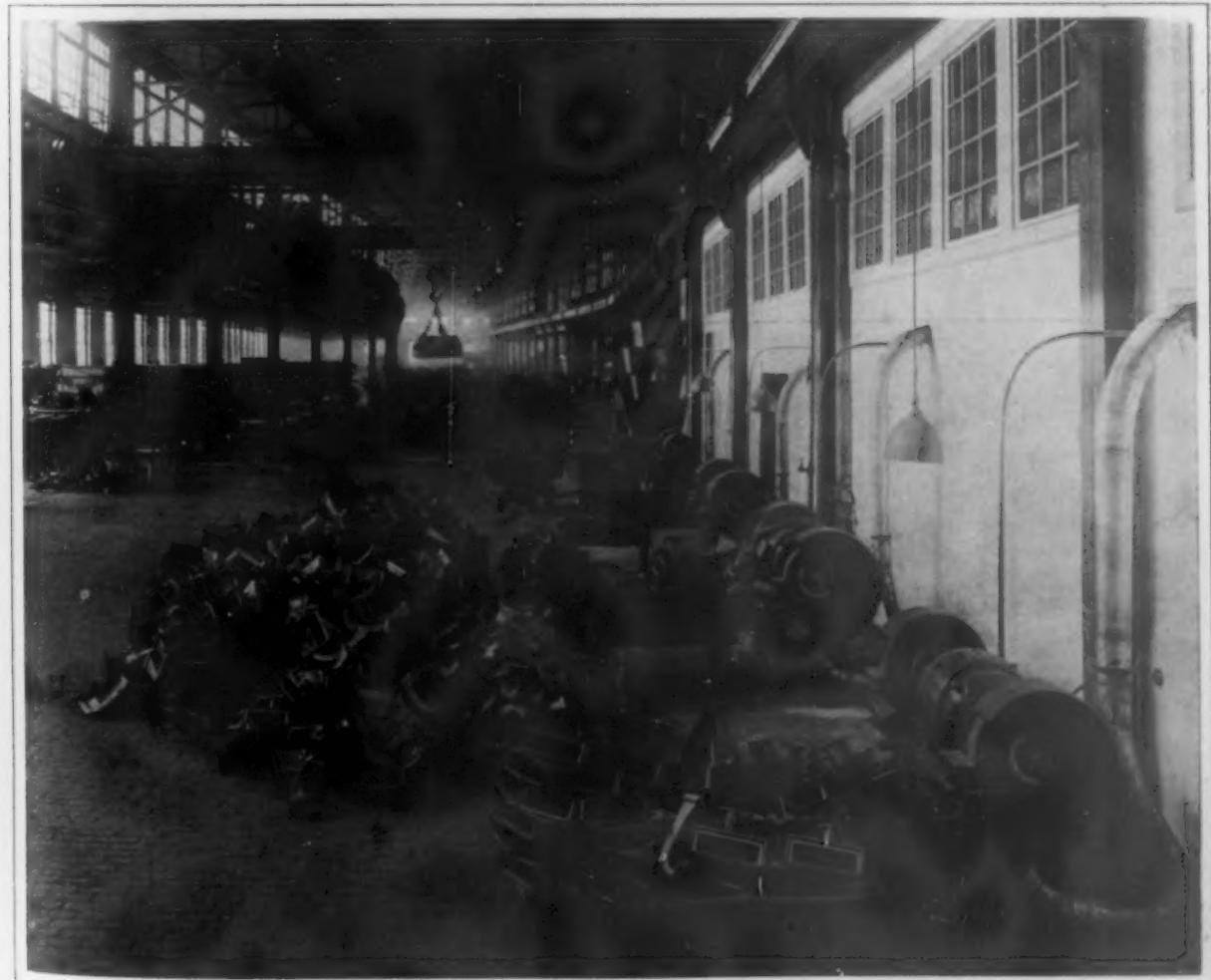
Room for the Comfort of Molders. It Contains 200 Lockers and Racks for Drying Clothing Which Can be Elevated to the Upper Part of the Room. The Steam Heating Pipes Are Carried Overhead. Between the Rows of Lockers Are Benches Similar to Those Beside the Tables.



The Cleaning Room, Containing Two Sand-Blast Barrels and Twelve Tumblers. All Cleaning Apparatus Is Equipped with Air Exhaust

light, airy room, as appears from the illustration. It adjoins the corridor referred to, and the men as they pass to and fro can be observed. From the corridor the visitor steps into the foundry proper, a structure 102 x 490 ft. Its general construction

and its two Niles 5-ton electric cranes, one of which is supporting a lifting magnet furnished by the Electric Controller & Mfg. Company, are shown in the accompanying view. Immediately to the left of the entrance is a room used for emergency re-



General View of the Foundry. The Castings in the Foreground Resting on the Block Pavement Are Cast-Iron Horns for the Victor Talking Machine Company, Camden, N. J.

pairs to flasks or other quick work in carpentry. Special attention is directed to this room as an economical arrangement. It is under the same roof as the foundry and about 25 ft. square.

To the right of the foundry entrance are a number of grinding wheels, all with air exhaust, and immediately behind them is the cleaning room. Machinery in all departments is electrically driven and compressed air is used wherever it is applicable, a pressure of 80 lb. being carried. The equipment of the cleaning room consists of two sandblast barrels made by the New Haven Sand Blast Company and 12 tumblers made by the W. W. Sly Mfg. Company. The dust is removed from all equipment by air exhaust.

An interesting use is made of the magnet in picking up odds and ends of iron from the floor of the foundry. One man devotes a few hours each afternoon to this work and in one day has picked up approximately 1000 lb. of scrap. The melting equipment consists of three cupolas made by the Barry & Zecher Company, equipped with Zippler tuyeres. The company ordinarily pours about 60,000 lb. a day, but can melt twice that amount when necessary. Two blowers supply the blast. All sand cutting is done at night and the molders find all in readiness for them to go to work promptly at 7 a.m. Twice a year the foundry receives a thorough cleaning and its interior is whitewashed. Conveniently located at the sides of the building are sanitary toilets.

STORAGE BINS AND THE CORE ROOM

Extending the entire length of one side of the foundry building and under an elevated railroad track is a series of masonry bins for the storage of sand and other materials. The cars dump directly into the bins. The core room adjoins the foundry on the same level. A feature here is the arrangement which obviates the necessity of core makers having to leave their benches with completed work. A number of steel trucks with roller bearings are used to remove the trays of cores, and as soon as a loaded truck is taken away an empty one is pushed into place. One of these trucks is shown in the illustration of the core room. All compounding in the core department is done with two machines made by the Standard Sand & Machine Company.

The company contemplates the installation of an overhead mono-rail system to carry the completed cores into the foundry. No women core-makers are employed.

The pattern storage room has the usual steel racks found in well-equipped plants and is of fire-proof construction. All patterns are card-indexed as to number of section of shelf, enabling any pattern to be located quickly. Operations have been started on an addition to the storage building.

TRUCKS USED ON UNLOADING PLATFORM

The shipping and unloading platform, also illustrated, adjoins a railroad spur which runs into the yard. It extends the full length of the foundry building and is entirely inclosed by a building 64 x 490 ft. The platform is on the same level as the cupola charging floor and connected with it by a wide entrance. Pig iron when taken from the cars is piled on roller-bearing trucks and wheeled to a space near the charging door of the cupola. A number of the loaded trucks are held in reserve. The system makes only one handling necessary. The unloading of the pig iron will be expedited when a lifting magnet is installed, for which plans are already made. The platform is constructed to sustain 1000 lb. per sq. ft.

PLAN OF DEALING WITH EMPLOYEES

None of the molders work over nine hours in one day. George Moyer, superintendent of the foundry, has some pronounced views with regard to the handling of men. First of all he advocates fair treatment and wages that are up to the standard. He has a standing challenge to his men to show him where they can do better. He maintains that it is best to anticipate, so far as possible, any request by the men for higher wages. In furtherance of his ideas he has in operation a system by which all piece-workers are paid a 10 per cent. bonus at the end of each month. For instance, if a man has earned \$110 in the month, he receives \$11 extra. The company lays emphasis on the necessity of its men being steady and sober and one result is that a considerable number own their own homes.

Mr. Moyer holds that a molder is entitled to know each morning the results of his previous day's



View of the Coreroom in Which Is Shown a Roller-bearing Truck Such as Is Used To Carry Trays of Cores Away from the Coremakers' Benches



The Loading and Unloading Platform Which Is Inclosed by a Building 64 x 490 Ft. From this Platform Materials Can Be Dumped into Bins. Pig Iron Is Loaded from Railroad Cars to Trucks Which Are then Pushed to the Space Near the Cupola Charging Door

work and what he has earned—something which every serious-minded worker should want to know. To facilitate the giving of this information there is placed at the end of the foundry nearest to the superintendent's office a rack containing an index card for each man. The cards are 5 x 9½ in. and on one side are columns for the recording of such data as card number, molder's name, department, customer's number, foundry order, pattern number, number of mold, number of castings produced, number of good castings, weight, price or rate, time consumed and amount due on piece work. On the reverse side of the card, for the information of the molder, is space for the date on which the work was done, pattern number, number of bad castings, number broken, and remarks. Should there appear to be an excessive number of bad castings the molder involved is called upon for an explanation.

AN UNUSUALLY SELF-CONTAINED OPERATION

In this article it was intended to give an idea only of the principal features of the company's foundry, but some facts pertaining to the entire establishment stand out too strongly to be ignored. The plant as a whole is self-contained to an unusual extent. It has its own water supply and makes its own electricity for all purposes. The water is obtained from two artesian wells, one 664 ft. and the other 650 ft. in depth. There is a cistern of 100,000 gal. and another of 90,000 gal. capacity, both for storage. Pressure is supplied by two towers of 100,000 gal. and 50,000 gal. capacity, the latter being part of a sprinkler system.

In the power plant is a newly installed 750 hp. Uniflow engine, connected to a 500 kw. generator, also a 500 hp. engine operating a 300 kw. generator. Electricity for light, heat and power is supplied to the various buildings in cables carried in tunnels through which a man can walk comfortably. The company has recently installed a two-stage Nordberg compressor with a capacity of 1200 cu. ft. of air per minute. There are other compressors of smaller capacity.

Henry Janssen is president of the Textile Machine Company and Ferdinand Thun is secretary and treasurer. The company owns 20 acres of ground.

The General Electric Company's Year

The General Electric Company has issued its twenty-third annual report which covers operations for the year ended December 31, 1914. The volume of business showed a contraction of about 25 per cent. as compared with 1913. The value of orders received was \$83,748,521, against \$111,819,142 in 1913, while the amount of sales billed was \$90,467,691.71, against \$106,477,438.76. The profits from sales in 1914 were \$8,970,963.39, against \$10,269,605.45. The income from other sources in 1914 was \$2,884,420.42, against \$3,796,184.43. The total profits and income in 1914 were therefore \$11,855,383.81, against \$14,065,789.88. After deductions for interest on bonds and dividends paid, the amount carried to surplus at the close of 1914 was \$3,145,059.85, against \$4,908,674.64.

The expenditures in 1914 for additions and improvements to manufacturing plants aggregated \$6,006,955.06, against \$11,373,118.10 in 1913, and the amount written off at the close of 1914 was \$4,370,792.83, against \$6,502,060.40 at the close of 1913. The company has followed its customary practice in writing off against income account its total expenditures in 1914 for patents and other outlay relating thereto, amounting to \$408,536.74, against \$662,925.40 for the preceding year.

As a result of business contraction the number of employees engaged in the factories and offices of the company and its subsidiaries at the end of 1914 was about 15,000 less than on the payroll at the close of the previous year.

The balance sheet shows a surplus January 1, 1915, of \$20,084,879.35. In the liabilities are debenture bonds totaling \$12,067,500. Accounts payable, including a quarterly dividend payable January 15, 1915, are put at \$4,780,291.57. The company has no note payable, nor is there any paper outstanding bearing its indorsement. The assets include cash on hand of \$22,528,887.99; stocks and other securities, accounts receivable, due from subsidiary companies, etc., aggregating \$54,661,171.68; merchandise inventories, valued at \$29,292,761.99. The financial condition of the company is thus shown to be exceedingly satisfactory.

The National Safety Council, 979 South LaSalle street, Chicago, has recently distributed two tables, giving safe loads, etc., on chains, rope and cable one compiled by the Fairbanks-Morse Mfg. Company, Beloit, Wis., and the other by the Swift Company, Chicago.

Farm Machinery Association Inquiry

WASHINGTON, D. C., May 3, 1915.—Practices of doubtful legality which tend to limit the field of competition and to enhance prices are found to have been employed by associations embracing manufacturers of and wholesale and retail dealers in farm machinery, according to a report which has been forwarded to President Wilson by Joseph E. Davies, chairman of the Federal Trade Commission. The report was prepared under Mr. Davies' direction before the Bureau of Corporations was merged in the Trade Commission, but in view of the conclusions embodied therein it is probable that the evidence gathered by the investigators will be carefully sifted by the commission to determine whether the members of the associations referred to have been guilty of specific violations of the Sherman anti-trust act and subsequent laws.

Almost every important manufacturer in the farm-machinery industry is a member of the National Implement and Vehicle Association, according to the report, and dealers in farm machinery have organized the National Federation of Implement and Vehicle Dealers' Association, which is composed of numerous State and interstate associations. These two organizations are national in scope and work in close co-operation. In the early days the various associations had agreements as to uniform prices, but the fear of prosecution under the anti-trust laws, as well as practical difficulties in making direct price agreements, led to other methods of influencing prices. Commissioner Davies directs special attention to methods employed in selling a wind-stacker attachment for threshing machines, which is marketed at a fixed price through a system of uniform patent-license contracts.

The prevention of price cutting among retailers and the raising of retail prices have been a matter of great concern to the implement and vehicle trade, says the report. The history of the formation of local clubs among competing dealers, with a view to the maintaining of prices, is sketched by Mr. Davies, who states that such practices would tend to raise the general level of retail prices and would militate against the independent action of dealers in the same locality in making prices.

The fundamental idea of the federated associations of implement and vehicle dealers, according to the report, is that "to retail dealers belongs the retail trade." They insist, especially, that it is wrong for any manufacturer who sells through regular dealers also to use any other methods of distribution which threatens to impair the trade of the dealers. Hence, they offer vigorous opposition to direct sales to farmers, the sales made through irregular dealers, and to sales through mail-order houses. The dealers' associations contend further that the plan of selling through a regular dealer is more economical for the manufacturer than any other plan of distribution and that the dealer renders better service to the farmer. This claim of the dealers to the retail trade has been indorsed by the National Implement and Vehicle Association.

The great problem of the dealers' associations, Mr. Davies says, has been to find some lawful means by which the members may be notified of the name of any manufacturer who declines to confine his trade to the regular dealer. The adjustment of complaints against individual manufacturers who have made direct and irregular sales has been an important part of the work of the dealers' associations. Members of some of the earlier dealers' associations agreed to withdraw their trade from manufacturers who refused to settle complaints to the satisfaction of the dealers, and until within the last few years the names of such manufacturers appear to have been freely discussed before the entire membership of the various dealers' associations. Court decisions adverse to such activities of dealers' associations as well as investigations by the Government have caused the federated implement and vehicle dealers in recent years to be cautious in handling complaints. At present, Mr. Davies says, the federated dealers' associations appear to rely principally upon the National Implement and Vehicle Association and the various jobbers' clubs to persuade their members

to confine their trade to the regular dealer. There are some manufacturers, however, who will not sell exclusively through regular dealers unless they are compelled to. The dealers desire, therefore, to create among such manufacturers a belief that the dealers will withhold their patronage if they persist in ignoring the dealers' claims. While the organized dealers disclaim any intention of maintaining a black list or of instituting a boycott against anyone, Mr. Davies asserts that it is clear that if they be permitted to disseminate information of this character those loyal to the principles of these associations would refuse to continue business relations with offending manufacturers even in the absence of an express agreement to do so.

A determined fight has been made by the organized dealers against the competition of mail-order houses, according to the report. They have not only tried to prevent manufacturers from supplying implements to such concerns, but also have conducted a campaign to prevent the establishment of a parcel post, on the theory that such facilities would benefit the mail-order houses. The organized manufacturers and dealers have also made earnest efforts to curtail the advertising facilities of mail-order houses by persuading manufacturers who sell through dealers not to advertise in farm papers which contain mail-order advertisements or encourage buying from mail-order houses.

In conclusion the report states that while a large part of the activities of the manufacturers' and dealers' associations in this branch of the industry are proper for the protection of legitimate interests, yet there are others of doubtful legality which tend to limit the field of competition and to enhance prices.

W. L. C.

Production of Copper in 1914

An advance statement by B. S. Butler, of the United States Geological Survey, has been issued giving figures for the production of copper for the United States in 1914. The smelter production of primary copper was 1,150,137,192 lb., as compared with 1,224,484,098 lb. in 1913. The decrease was about 6.1 per cent. The total production of new refined copper was 1,533,781,394 lb., which was a decrease of 81,286,388 lb. from the production in 1913. The production of electrolytic, Lake, casting and pig copper from primary sources and the production of secondary copper by the regular refining plants in 1914 was 1,565,708,374 lb., as compared with 1,652,990,541 lb. in 1913. Included in these figures are 158,009,748 lb. of Lake copper in 1914, against 155,715,286 lb. in 1913.

In addition to the secondary metal treated by the regular refining companies, plants that treated secondary metal exclusively produced a total of 224,000,000 lb., of copper as copper and in brass and other alloys of copper, making a total production of 256,000,000 lb. from secondary sources. Adding the output of these plants to the production of regular refining companies, the contribution of domestic plants of this country to the world's supply of copper for 1914 is found to be 1,790,000,000 lb.

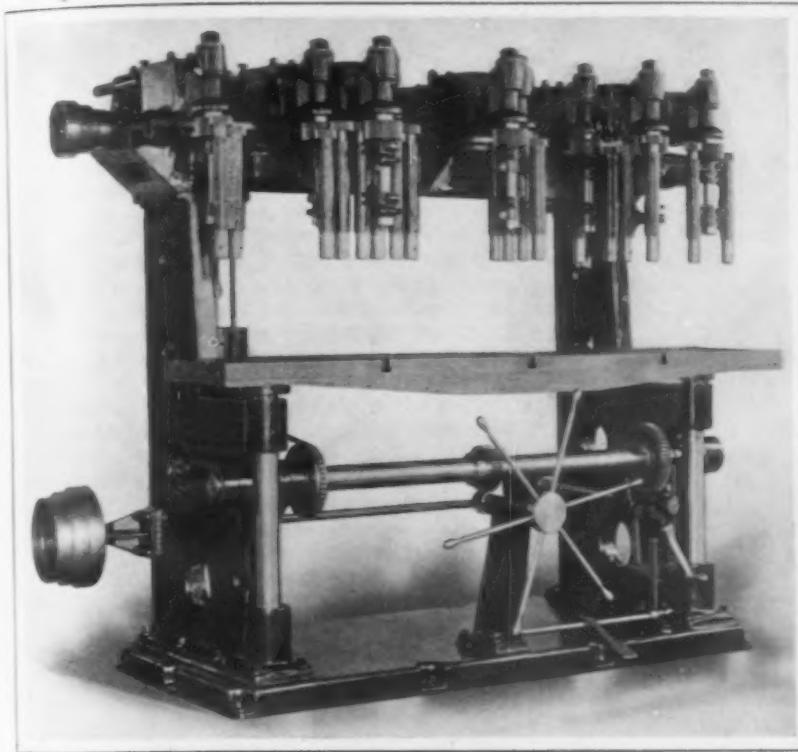
Returns from all producing companies show that on January 1, 1914, the stocks of refined copper were 90,385,402 lb., and on January 1, 1915, were 173,640,501 lb., showing an increase in 1914 of 83,255,099 lb. In addition to the refined copper stocks there were at the smelters, in transit to refineries, and at refineries blister copper or material in process of refining amounting to 203,067,571 lb. January 1, 1915, as compared with 247,789,811 lb. January 1, 1914.

The apparent domestic consumption of refined new copper in 1914 was 711,624,158 lb., against 812,268,639 lb. in 1913, and 775,978,332 lb. in 1912.

Motor cars are extensively used in India, there being about 2000 in Calcutta and 1000 in Bombay. Values of exports of cars to India in the fiscal year 1913-14 are stated as follows: Motor cars, \$3,680,855; motorcycles, \$346,490; motor wagons, \$185,165; parts and accessories, \$761,257. The United Kingdom leads in these items, with the United States second.

Adjustable-Spindle Boring Machine

To enable any point in a space measuring 14 in. in width and 6 ft. in length to be reached for boring wood or drilling light metal, the Reynolds Pattern & Machine Company, Moline, Ill., has



An Adjustable-Spindle Wood Boring and Light Metal Drilling Machine Capable of Reaching Any Point in a Space Measuring 14 In. x 6 Ft., the Minimum Distance Between Spindle Centers Being 2 In.

brought out an adjustable-spindle machine. Practically any pattern of holes can be drilled in this area, the only limitation being that the spindle centers shall not approach each other closer than 2 in.

The machine, as will be noticed from the accompanying illustration, consists of two vertical housings supporting a cross rail which has considerable depth from front to rear. The top surface of the rail is faced and in it is a semi-circular groove containing a continuous spiral that meshes with the spiral gear in the drilling heads mounted upon the rail. These heads can be adjusted to any point along the rail or horizontally across it.

The drill spindles are carried in brackets capable of being adjusted to any point on the entire circumference of the circle surrounding the central stud carried in the end of the drilling head. The spindles are driven by spur gears on their upper ends that mesh with a gear on the central stud. The gear on the central stud receives power from the main spiral through bevel and spiral gears. It is double the width of the pinions on the drill spindles, so that the latter may overlap each other and thus be brought close together. The longitudinal and transverse adjustments of the heads on the rail and the circular adjustment of the spindles around the central stud enable any point in the space covered by a spindle to be reached, and any desired pattern of holes may be drilled. For example, it is possible to drill a practically unlimited number of holes in a straight line with the distance between the centers at least 2 in., or four holes can be drilled in a straight line at right angles to the table, not less than 2 in. apart or more than 14 in. from one end of the row to the other. It is also possible to drill six holes on a circle having a radius of 2 in., as well as many other patterns which, it is emphasized,

were formerly secured only by the use of special heads having fixed centers. While 2 in. is the closest center distance with the regular heads, if it is desired to space the holes closer special heads can be supplied.

The table feed is by rack and pinion, the former being cut on the flattened side of the steel table supports. The pinions are cut to form an integral part of the heavy feed-shaft which is driven through a worm and worm wheel from the cone pulley on the end of the main driving spindle. A pilot wheel for hand feed is provided, and by this the table can be fed up by hand until the work strikes the bits. At this time the power feed is thrown in by the foot treadle. The feed trip is by a drop worm knockout, and a hand trip is provided so that the feed can be stopped at any point. The table is furnished with a counter-balance.

The machine is arranged for either countershaft or motor drive. Gear guards are provided but these were removed to show the construction of the machine.

A paper on oxy-acetylene welding and cutting, which was read by J. R. Wilson, of the Davis-Bournonville Company, at a meeting in February of the Detroit Foundrymen's Association, has been printed in pamphlet form, and may doubtless be had by applying to Mr. Wilson, 88 West Adams avenue, Detroit, Mich. The paper covers the application of the process to gray-iron and steel foundries and to the sheet metal industry. Besides the description of the apparatus and the method of obtaining the materials for it, the paper is particularly valuable in its general information regarding working practice.

The New Koppers Coke Ovens at Youngstown

The recent decision of the Republic Iron & Steel Company to build 75 additional by-product coke ovens of the Koppers type at Youngstown will bring the number of such ovens at this plant up to 143. The present plant of 68 ovens has been in service for about a year, and in that time the output of the company's blast furnaces has increased, while there has been a decrease in the amount of coke used per ton of pig iron. The 68 ovens at the Republic plant are operated on a mixture of 85 per cent. high volatile and 15 per cent. low volatile coal. The early practice at the Gary plant used a mixture of 80 per cent. low volatile and 20 per cent. high volatile coal. Under the present practice at by-product coke ovens in this country mixtures are used varying from 21 per cent. to about 30 per cent. volatile, the percentage depending on the cost or availability of the coal. At the Republic Company's plant at Youngstown the 143 Koppers ovens will have a capacity of 1675 net tons of furnace coke per day. The present battery of ovens is operated on slightly over 16 hours coking time. It is planned to operate both the new and the old battery on 18 hours coking time, because of the increased by-product yields from the longer coking period. The surplus gas per day from the 143 ovens amounts to 15,000,000 cu. ft. of 570 B.t.u.; the coal tar product per day will be 21,500 gal.; ammonium sulphate, 56,000 lb., and benzol output, 6,000 gal. The value of these by-products at normal prices is in excess of \$2 per ton of coke. In addition there are to be considered about 100 tons per day of small coke which can be used as domestic fuel and 100 tons of breeze available for use under boilers.

Handling of Repair Work in the Factory

Suggested System for Doing This Economically—Good Results Obtained by One New England Builder of Machine Tools

BY ALBERT A. DOWD

The repairing of broken machine parts, tools, fixtures and other devices which make up factory equipment, is a problem that confronts every manufacturer, and the delays often incident to this work affect his profits to a considerable extent. In many cases, general repair work on machines, tools or fixtures, is the subject of very little thought on the part of the manufacturer, and when a piece of repair work is to be done, it is turned over to some mechanic who does not happen to be engaged on an important piece of work at the time.

Running repairs, such as work on countershafts, lineshafts, belts, etc., are usually taken care of by the millwright or his assistants, and are seldom the cause of much delay, unless a serious accident has occurred. Machine parts, however, when broken, require more time and are often the source of annoying delays, especially if the nature of the trouble is such that the machine cannot be used until repairs have been made. Many times an operator, having broken a machine, will worry along with it in this condition, rather than wait for it to be repaired. Tools and fixtures are patched up temporarily for the same reason and sometimes used in such a condition as to affect the accuracy of the product. In cases of this kind, although the production still continues, it may be at about half or two-thirds the usual rate, which is naturally a source of loss to the manufacturer. I have seen an operator using a C-clamp on a piece of work in a jig which had been broken to avoid the delay which would be caused if it were sent away for the necessary repairs, and each piece which he handled took about twice as long to set up and remove as it would have done under normal conditions. Of course, on a small lot of pieces, a temporary arrangement of this sort might serve to get out the work a little sooner than if the jig were permanently repaired before proceeding, but, as a usual thing, it is poor economy.

One of the best systems for handling repair work quickly and economically is in use by a large machine-tool builder in New England. A description of the methods used may prove of interest to other manufacturers who may be able to make adaptations to suit the conditions in their own factories.

Minor repairs are taken care of by the foreman of the department in which the tools or machines involved may be located, as unnecessary delay is avoided by having the work done in the department most affected. It is obviously of advantage to each foreman to put the work through as rapidly as possible in order that the efficiency of his department may not suffer, and for this reason it has been found profitable to handle it in this way. It is an invariable rule that all breakages must be reported to the foreman at once so that he can immediately take steps to have the proper repairs made. For minor repairs, when these are to be made in the department, men are selected whose services are particularly applicable to this class of work. Considerable ingenuity is required in general repair work, for while one man may repair a broken tool or fixture in a comparatively short time, it may not be strong enough to perform its functions properly and for that reason prove a failure. If properly done, repaired work may be even stronger than it was originally and a man should always be selected who can be depended upon both for his ingenuity and rapid workmanship.

That the superintendent's office may be kept in touch with all accidents which are of such a nature as to cause delay in production and necessitate repairs, each department is furnished with two repair tickets, one of which is red and the other white. The

red ticket is used for rush work and the white for ordinary repairs, and each of them contains information sufficient to acquaint the superintendent's office with the important features of the case. In each department two wire baskets are placed in a convenient place for incoming and outgoing departmental correspondence. A boy makes the round of the factory at least once every hour during the day and distributes to each department the correspondence intended for it and takes away whatever is intended for other departments. Reports on minor repairs are made out on the white ticket and placed in this basket to be taken up on his rounds, but a red rush ticket is sent immediately to the superintendent's office by one of the men in the department, so that there will be no delay. In the event of broken tools or fixtures these are sent directly to the toolroom with a duplicate red ticket, when work is needed immediately, and the toolroom foreman details a man to make the repairs without waiting for further instructions. In the meantime the superintendent's office O.K.'s the ticket sent to it and marks it with a shop order number, against which the repairs are to be charged. This is sent through to the toolroom in the regular way and causes no delay because the toolroom foreman does not wait for it before he goes ahead with the work. The selection of men to whom repair work can be profitably given in the toolroom is as important as the rapid handling of the work itself, but a foreman of ability soon determines the men most suited to work of this character. It is not always that the best toolmaker makes the best man for handling repairs, for the work may be distasteful to him and for that reason he frets and fumes over a repair job because he doesn't like to do it and would prefer a nice piece of tool work. It is therefore poor policy to give work of this kind to him, unless it is of such a character that it requires the relocating of bushings or something requiring considerable accuracy. In the case of a jig or fixture having a broken lug, clamp, or other part not specifically important as regards accuracy, it is often found advisable to give the work to some man who may not be a toolmaker at all, but a general all round man; who may not be a particularly accurate workman, but whose ingenuity makes up for his lack of accuracy. In every toolroom men can be found who seem to have a knack of repairing work rapidly and well, and such men should always be selected in preference to others whose general work may be better, but who do not have the faculty mentioned. A discriminating foreman soon finds out who can handle the work to the best advantage.

It not infrequently happens that there is a change in the design of a piece of work for which a jig or fixture has previously been built. This change in design may require the changing over of the fixture in such a way that it may either be used for the piece as originally designed or for the newer model. It is not always possible to make the change on the original fixture without complicating matters and even when possible, the original drawing should be made over by the tool designer before the work is put into the factory. It is a great mistake to allow work of this kind to be handled by the toolmaker without a thorough understanding of the important features of the case and for this reason the designer should decide and plan out the work to the best advantage before it is given to the toolmaker.

This brings up another point in general repair work, and that is the designer's responsibility. In certain cases the need for repairs is primarily caused by weak points in construction. For these the designer is naturally responsible, and his attention should

always be called to the failure of any tool or fixture to perform its functions in an efficient manner so that he can guard against similar trouble in his future work. In addition to this the designer of any piece of mechanism is familiar with the work which it is required to do and, knowing these points, he may be able to suggest a method of repair better than a toolmaker or other workman who does not know the stresses to which the work is likely to be subjected. He is more likely to suggest a method which does not appear quite as much like patchwork as it might if the repair was made without much regard for appearance. Often he can make a freehand sketch, showing the toolmaker what his ideas are in regard to the repair and in this way save time for all concerned.

To make the working of the red ticket apparent, let us take an example; a turret lathe operator engaged in important production work breaks the pinion which operates the longitudinal turret feed. He immediately reports the accident to the foreman, who makes an examination of the machine to see how serious the injury is and to determine the probable delay which will be caused while repairs are taking place. He at once makes out a red ticket and sends it by a boy to the superintendent's office, where it is O.K.'d and taken to the toolroom. The foreman of this department details a man to take the work in hand, and sends him to the turret lathe department. In the meantime, the foreman of this department has removed the turret slide and taken out the pinion with the aid of the operator and has also examined other parts likely to have been affected by the accident, but finds nothing else of a serious nature. Two teeth are found broken out of the pinion and the question arises whether to put in a few pins to act as a temporary repair or to make a new pinion. The pin method not being considered efficient a new pinion is decided upon and the toolmaker gets his stock and starts in on the work at once. As the job is a rush one he pushes it along as fast as possible, and by working a couple of hours overtime, with a helper, succeeds in completing the pinion and assembling it on the machine, so that when the operator arrives the next morning he can go to work immediately. This is not an exceptional case by any means, but it shows how quickly work of this kind can be handled if taken care of in the right way.

In the installation of a system of handling repairs such as that mentioned, it is not so much the actual system that counts as the living up to the spirit of the thing and making every effort to produce results. Also the selection of men to whom the work is entrusted is of great importance and cannot be overlooked or underestimated.

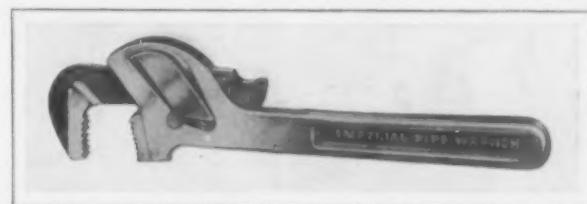
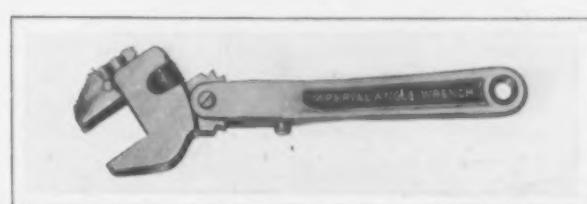
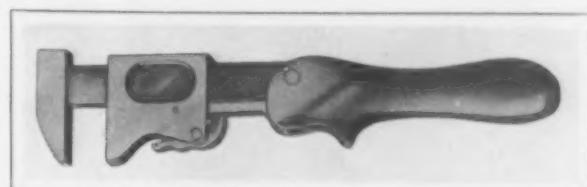
Lead Production in 1914

The production of refined primary lead in the United States in 1914, that smelted from ore, was 542,122 net tons, against 462,460 tons in 1913, a gain of 17.2 per cent. The primary refined lead available for consumption in the United States was 449,052 tons in 1914, against 419,485 tons in 1913, an increase of 7 per cent. Imports of lead in ore, base bullion and refined in 1914 were 56,676,803 lb., compared with 114,293,966 lb. in 1913, a decline of over 50 per cent. The world's production of lead in 1913 was 1,270,458 tons, of which, alluding to the source of the ore, the United States produced 32.4 per cent. These data are from a pamphlet just issued by the United States Geological Survey on "The Production of Lead in the United States in 1914," by C. E. Siebenthal.

The General Insert Company, 44 North Fourth street, Philadelphia, Pa., has brought out a new type of insert for use in connection with concrete construction. The insert adapts itself to various sizes of bolts, pipes, rods, etc., and one size is all that is required for a building. The shape of the insert is that of a keystone which is relied upon to bear against the concrete at the sides and increase the carrying strength, as well as preventing it from pulling out of the concrete.

New Quick-Acting Screwless Wrenches

Three wrenches have been added to the line manufactured by the Imperial Tool Company, Bloomington, Ill. These are of the monkey, angle and pipe types respectively. All three are intended



Some Recently Developed Wrenches for Various Purposes: a Quick-Acting Monkey Wrench, an Angle Wrench with Reversible Cap and a Pipe Wrench Operating without a Screw

to operate quickly and, in the case of the angle wrench, to provide a number of adjustments as to the spacing and angularity of the jaws.

The monkey-wrench is of the quick-acting grip type. The jaw operates without a screw and is handled entirely with the thumb. In this way, it is pointed out, the backing away, which has to be done on a wrench where a thumb screw is used, is eliminated. Beside the quick-acting feature, the wrench is of the grip type, and the harder the handle is pulled, the tighter, it is emphasized, is the grip of the wrench jaws on the nut. Another feature is that it is a ratchet wrench and does not have to be taken off the nut each time, as by merely pushing back on the handle, the jaw automatically ratchets and grips for the next pull. The construction is simple, and it is possible to use it the same as an ordinary monkey wrench and also do several other things.

The angle wrench is capable of a number of adjustments and takes the place of several different sizes of solid and S wrenches. By pressing the thumb on the key it is possible to ratchet the wrench the entire eight notches at once or one notch at a time, while, when the thumb is released from the key, the handle becomes solid and the nut can be turned in either direction. This wrench is built with a solid jaw for the mechanic and also with a reversible cap, as illustrated. This reversible cap feature enables it to be used either as a pipe or a monkey wrench, thus combining two tools in one. The change can be made almost instantaneously.

The pipe wrench, like the monkey wrench, is a quick-acting one, being handled entirely with the thumb. The upper jaw, it is pointed out, has a great amount of forward and back play, so that it is possible to grasp the pipe being handled quickly and release it practically instantaneously. The construction of the wrench is simple, there being only six parts in all.

A Casting Process for Producing Rods

Radical Departure in the Industry —The Mellen Method and Its Application to the Non-Ferrous Metals

A machine that does away with the present system of making rods of lead, zinc, brass, copper and aluminum by rolling and that may be made applicable to steel, has been developed by the Continuous Casting Corporation, of Newark, N. J. The inventor is Grenville Mellen, of Llewellyn Park, N. J., and the machine is known as the Mellen rod-casting machine. It is a small continuous casting machine which with one operation gives results now requiring much labor and fuel and considerable time and space. The process involves a radical change in the rod industry.

The hot liquid metal is transferred from the melting crucibles directly into an endless chain of mold blocks in the machine, where solidification takes place, and the rod comes out continuously in a solid form at one end as long as the molten metal is supplied. The operation of these mold blocks so as to produce a solid rod of uniform structure constitutes an important part of Mr. Mellen's invention, which is described as below by R. C. Patterson, Jr., assistant secretary of the Newark company, in a paper prepared for the San Francisco meeting of the American Institute of Mining Engineers in September.

THE VERTICAL TYPE

The vertical machine, shown in one of the illustrations, 12 ft. in height over all, 2 x 3 ft. in horizontal cross-sectional area, and 6000 lb. in weight, has a framework of cast iron, holding in position two endless chains of mold blocks, which are made in sections and join in center alignment. The mold orifice is made up of these mold sections, into which the liquid metal flows. The molding chains are composed of steel blocks, grooved on one face to form the molding cavity, and linked together with flexible joints. Each block is carried on four rollers which guide the chain around the end sprockets and carry it in its course through the machine.

The accuracy of alignment requisite to

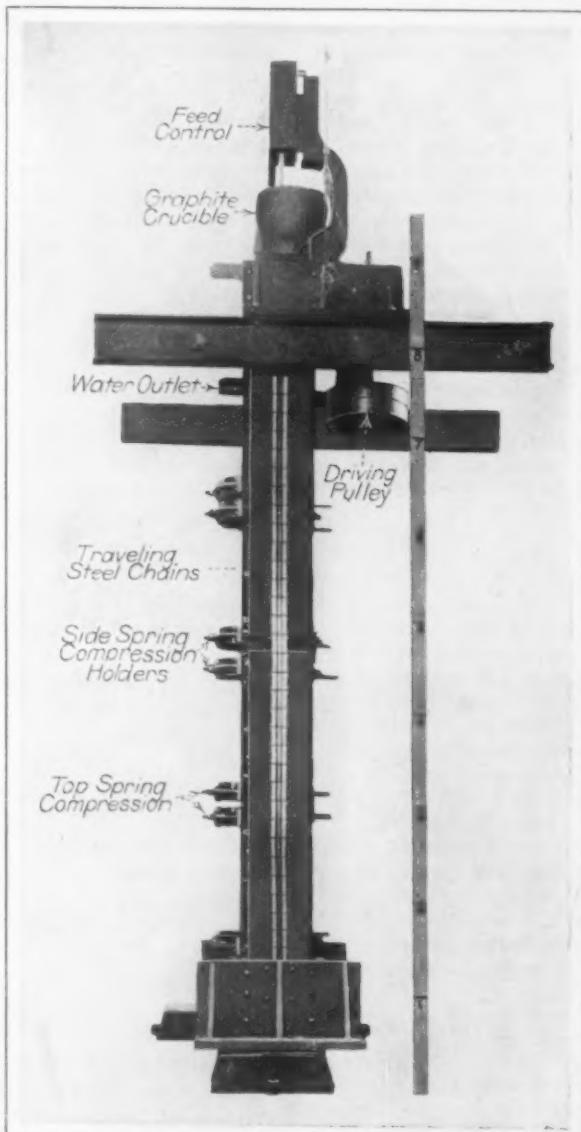
the production of a perfect rod in the mold groove formed by these sections is secured by careful machine work, and by building the four ways, down which the alignment takes place, so that two of the sides are fixed permanently, while the opposite sides are held to their position by spring pressure. The guides carrying the molds, while in casting position, are water-cooled square tubes.

The length of this machine is somewhat indeterminate. A certain amount of both time and cooling surface is required to solidify the metal in the mold; and one may either use a long molding chain and run it fast, or shorter chain and run it correspondingly slower. We have found, however, that with 8 ft. length between centers for the chains a casting speed of 25 ft. per minute for $\frac{7}{8}$ -in. brass rod will not cause the molding blocks to rise in temperature above 450 deg. F. Many experiments

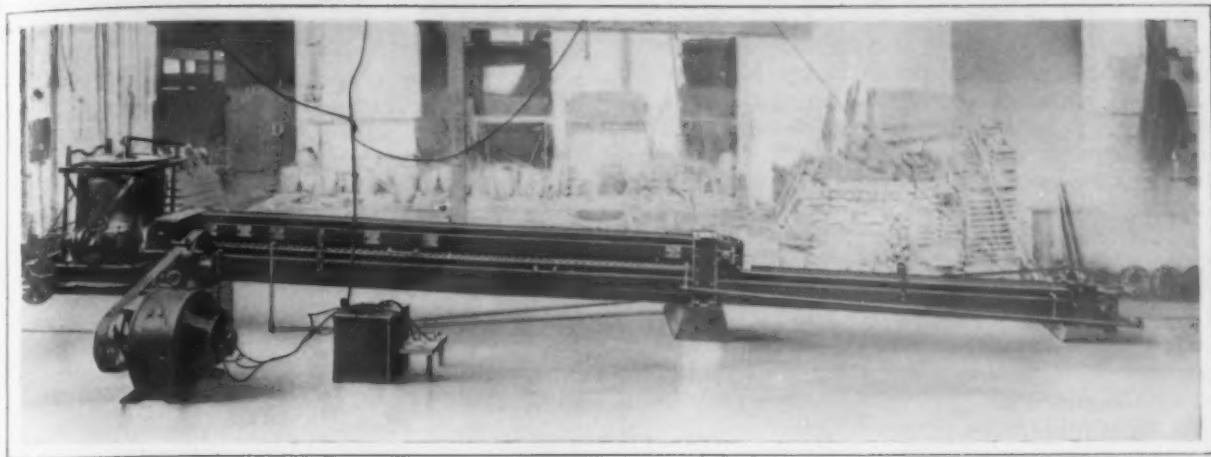
have shown that in the casting of bronze mixtures, the pair of molding blocks should have about six times as much sectional area as the cast rod, to allow a reasonable temperature difference for the rapid removal of heat.

The first machines designed for this process of continuous casting were vertical; but the desire of practical rod-mill men to operate with the molding groove horizontal led Mr. Mellen to spend considerable time in experimental improvements of the mechanical details, in order to secure a maximum efficiency for the horizontal machine. In this attempt, numerous troubles and intricate problems were encountered. The machine would always cast rods; but its successful operation in a horizontal position required more skill than that of an ordinary laborer. After much experiment the axis was first made slightly inclined; but finally the vertical position was re-adopted; and in this form one laborer, with a little preliminary instruction, can manage the machine without difficulty.

The chief hindrances to horizontal operation were: The difficulty of



Side View of Vertical Type of Mellen Rod-Casting Machine, Showing Casting Chain Which Travels Upward to Meet in a Common Center the Opposite Chain, These Two Uniting to Form a Solid Steel Mold into Which the Molten Metal Is Cast Through a Silica Tube Emerging from a Graphite Crucible.



Horizontal Type of Mellen Rod-Casting Machine for Lead and Aluminum. The Melting Furnaces and Crucibles Are Shown in the Background

completely filling the molds, and the circumstance that, in working horizontally, the lower chain did the greater part of the work and became, after a time, excessively heated, while the upper chain remained relatively cool. This caused an irregular structure both in the cast rod and in the drawn product resulting therefrom; and as a result the required strength tests were not satisfactory. In the vertical arrangement these difficulties automatically cured themselves since the metal completely filled the mold, with uniform contact all around, thus causing each portion of the chain to do its work, and giving a symmetrical structure to both rod and resulting wire.

The importance of making all of the chain work all the time is shown by the fact that in the vertical type of machine the chain can be considerably shortened, and yet the machine is capable of running at higher speed than when arranged horizontally. This vertical arrangement, however, necessitates operation on two levels.

The flow of metal into the machine is controlled by an electrically operated automatic device, which adjusts the feed to the speed at which the machine is operated. If for any reason the machine should stop, the flow would be automatically shut off. A safety device is incorporated into the drive, so that if any foreign material clogs the chain a safety pin is sheared, thus protecting the mechanism from injury. The rods are delivered from the machine immediately to the die of the bull block, where they are drawn down to suit particular orders.

ADVANTAGES GAINED

This new method of manufacturing rods does away with the following steps of the old system:

Casting the wire bar.

Handling the wire bar from the molds.

Rehandling the wire bar to and from the reheating furnace.

Reheating the wire bar.

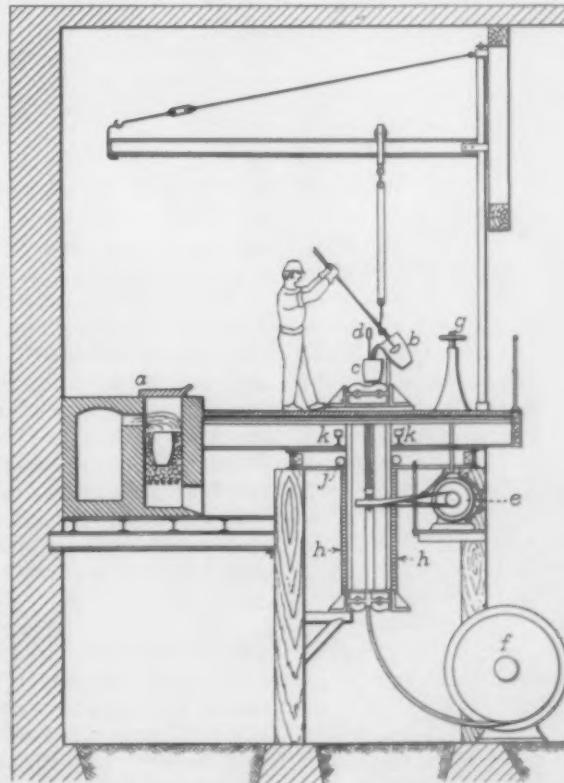
Rolling the wire bar.

It also eliminates the loss from oxide scaling during heating and rolling. These economies involve, of course, the saving of much capital now invested in heating furnaces, rolling mills, power plants, land, and buildings. Since the power required to run this machine is only about 5 hp., the cost of large engines, boilers, coal bins, etc., is practically done away with. Another advantage is the elimination of danger to human life. The apparatus is completely inclosed, so that the operator is protected from injury. Finally, the labor cost of this process is but 5 per cent. of that of the old method, the caster being the only workman required.

A later development of this continuous casting machine is the machine, shown in one of the illustrations, casting rods of lead and soft-metal alloys, $\frac{1}{4}$ in. and upward in diameter. This is the first step in the manufacture of shrapnel bullets; and the machine will cast per hour enough lead rod for more than 200,000 bullets. The only motive power required is that which is necessary for overcoming the friction resisting the motion of the traveling mold chains, which is in the neighborhood of from 2 to 3 hp. This lead machine is practically the same as that used for brass with the exception that it is operated in a horizontal plane. Also, the horsepower is slightly decreased, and the machine is a few feet longer.

In two drawings, the area of brass rod is reduced about 27 per cent. without annealing; but it must be realized that the area reduction and pull are variables depending upon the mixture cast. An 80-hp. motor is used in handling the $1\frac{1}{4}$ -in. rod. The continuous casting machine is also applicable to the production of aluminum and zinc rod. Aluminum rods are produced with diameters ranging from $\frac{3}{4}$ in. upward.

The casting-shop arrangement is shown by one of the illustrations.



Cross-Section View of a Casting Shop Using the Vertical Type of Mellen Rod-Casting Machine

This may be considered a cross-section of the shop with a long line of melting furnaces in parallel to the one shown, all of which supply metal to one casting machine. The melting furnace *a* is one of 40, the crucibles of which have a capacity of 220 lb. each with six heats per 10 hr. All of these are considered just sufficient, when operating at full capacity, to satisfy one casting machine in 10 hr. The feed basin *c* consists of a graphite crucible and has a capacity of 194 lb. The automatic feed-control device *d* consists of a solenoid magnet operating in a battery circuit, one terminal of which is grounded on the machine and the other terminal attached to a graphite point projecting into the mold orifice. When the metal in the mold rises to this graphite terminal it closes this circuit and the magnet is energized. This magnet operates upon a beam to partly close a carbon valve controlling the inlet of metal into the mold bore. When the rod that is being cast into the molds is carried below this graphite tip, the circuit is broken and the valve

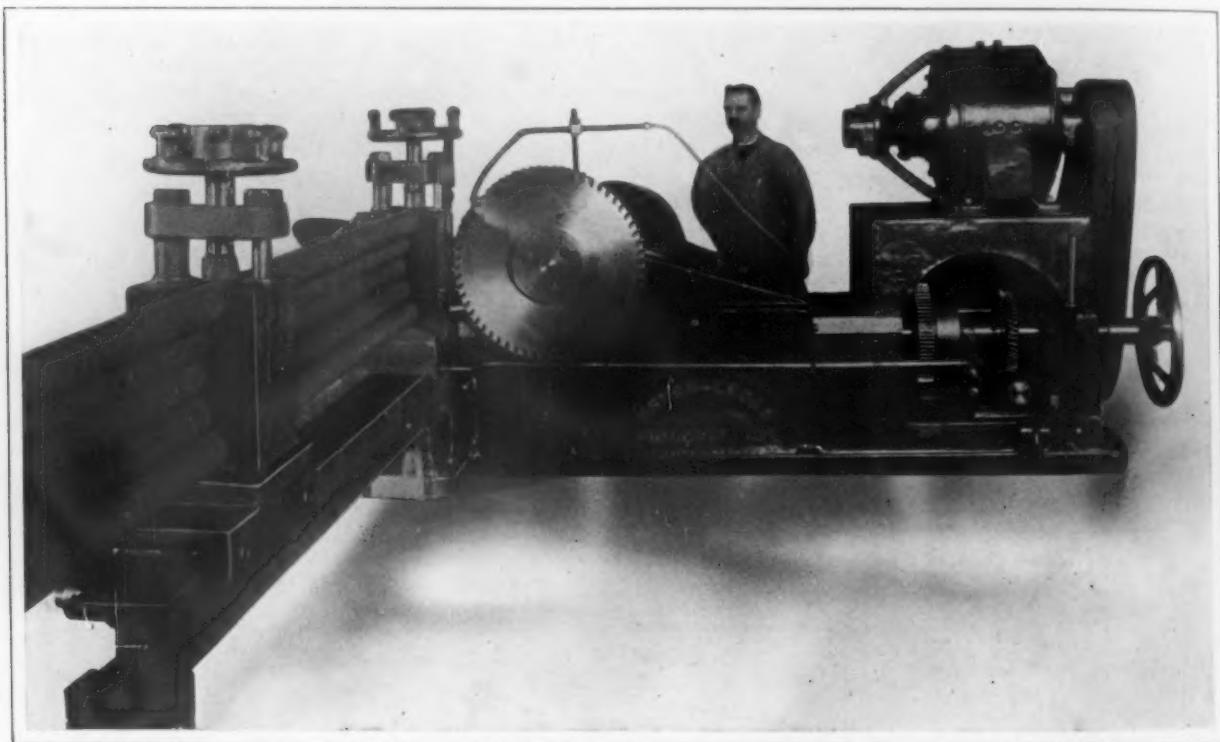
which is applied in liquid form by means of air brushes *k*.

The machine's operating cost is less than 30c. per ton of molten metal into the form of rods. United States and foreign patents have been secured.

Cold Sawing Machine for Shrapnel Bars

Another addition has been made to the line of metal-working machinery that has been developed for manufacturing munitions of war and particularly shrapnel. This is a cold saw cutting-off machine that has been placed on the market by the Espen-Lucas Machine Works, Philadelphia, Pa. The machine, which is of the rapid production type, is designed for handling and cutting off steel bars to the proper length for manufacturing shrapnel shells.

The saw carriage has a feed of $\frac{1}{2}$ to 5 in. per



A Cold Sawing Machine That Has Been Developed for Handling and Cutting Off the Steel Bars Used for Making Shrapnel Shells

lifts, allowing more metal to enter the machine.

The variable-speed motor *e* is used to drive the machine. The variation in speed is necessary to enable the machine to be operated on different brass mixtures, some of which flow more freely than others. This speed is suitably adjusted by the operator at the speed-control wheel *g*.

The reeling device *f* takes the rod delivered from the machine and rolls it into bundles to facilitate its further handling. The cooling water jets *h* are a series of pipes arranged opposite the faces of the returning molds through which a series of streams of water are played directly upon the mold faces for cooling purposes. These streams are not turned on until the molds have reached a temperature sufficient to vaporize this water. In practice the molds appear perfectly dry a few inches above the uppermost jet. Above these water jets are noted the mold-cleaning brushes *j*. These, which are made of steel, revolve by a chain mechanism and serve to clean any deposit from the surface of the mold and prepare it to receive the necessary facing.

min., and any amount within these limits may be used, it being pointed out that the cutting capacity of the machine is limited only by the nature of the material that is being handled. The variation in the feed is obtained through a friction plate which is controlled by a handwheel. When the desired rate is obtained, the feed changing mechanism is automatically locked, but changes in the rate of feed can be made while the machine is in operation. The saw carriage also has a quick return mechanism which is controlled by the same lever to effect any change in the cutting speed desired. An automatic stop for regulating the travel of the saw carriage is provided.

The drive is through a main shaft, phosphor-bronze worm wheel and crucible steel worm, the last two running in oil. The spindle extends the entire width of the saw carriage, and the saw blade is bolted directly against the driving gear, a construction which is relied upon to insure rigidity and eliminate torsional strain between the gear and the saw blade.

CONGESTION IN FOUNDRIES

Eliminating Troubles Due to Faulty Original Design of Plants

BY H. M. LANE

Frequently a plant is designed and built for a given output, but fails to come up to the expected amount of product. At times it is rather puzzling to see just why the plant failed, this being particularly true in the case of foundries. A number of years ago the writer had occasion to overhaul a foundry, in which the core department and the foundry were in buildings located at right angles to each other. All the cores had to enter the foundry at one corner of the building and all the castings had to go out through the same opening on their way to the cleaning room. The coreroom had been designed with ample capacity to take care of the proposed production, and the foundry had sufficient floor space to put up the required number of molds. The cleaning room had ample facilities, but the plant could never reach half of the desired output without an excessive amount of bad work.

LACK OF STORAGE SPACE FOR DAILY PRODUCTION

A study of the situation revealed the fact that in designing the foundry sufficient storage space had not been provided between the foundry and the cleaning department for the daily production. It took 8 hr. to tumble the daily production during the day time, and the sand blast worked 10 hr. to handle its quota of the work. This necessitated some place where the castings could be piled by the night gang, ready for the cleaning force to handle them. About half the output could be piled in the cleaning room, but even this amount was in the way and made it impossible to work the cleaning equipment efficiently during the morning.

No storage space for finished cores was provided, as well as for cleaning, inspecting, blacking and pasting cores. Consequently the coreroom was forced to take care of the finishing of the cores in space that should have been devoted to core making. To take care of the cores it was the practice of the coreroom to send them to the molding floor as fast as they were finished. This resulted in undue breakage of the cores by the molders, their helpers and the night men, and when the last were wetting down and cutting over the sand they would frequently throw water on the cores, which would result in blown castings the next day.

PROBLEM SOLVED BY USE OF A TROLLEY

The problem at first looked hopeless, but was solved by installing a trolley, capable of carrying a ton of castings at a time and making provision for storing a considerable portion of the daily cast in boxes in the gangway leading to the cleaning room. The first of these improvements eliminated the blocking of the traffic at the door into the foundry by carrying the pieces through it in one-man loads. The boxes stored in the gangway leading to the cleaning room were taken in as the material was required, thus relieving the congestion in that department.

To gain the necessary space in the coreroom it was necessary to obtain an intensified production from the floor space available. This was accomplished by using a type of bench which enabled the core maker to produce work with the smallest possible number of motions, everything being brought to him and his product being taken away by labor-

ers. A schedule for passing the material to and from the ovens was worked out, and a green inspection of cores as well as a dry one established.

Under the old arrangement a large percentage of cores was broken while green and this necessitated the core maker turning out approximately 125 cores to obtain 100 castings. Under the new scheme the total breakage of cores was reduced to less than 2 per cent., which alone amounted to an increased production of approximately 20 per cent. from each core maker. The other changes made increased the output so that the total advance was over 100 per cent. of finished cores from each bench or machine. This intensified production made available space for inspecting, pasting and other necessary work in preparing the cores for the molders.

HOW BETTER HANDLING OF CORES WAS EFFECTED

The problem of putting thousands of cores through a single doorway and protecting them from breakage in the foundry was still unsolved. To accomplish these two results a set of wooden core carrying boxes and racks for storing them at the molding floor were made. The boxes were of uniform length and width, but varied in depth and were handled on four-wheel furniture trucks having multiple shelving capable of accommodating from 12 to 20 boxes of cores. The boxes of cores were put on trucks at the inspector's benches and the trucks wheeled under the trolley which picked them up and ran them into the foundry.

Formerly two men carried a frame on which from 70 to 120 lb. of cores was delivered per trip. With the trolley system and the trucks one man delivered from 300 to 400 lb. of cores in boxes, and in the case of large cores which were placed directly on the shelves of the trucks, frequently delivered 1000 lb. In addition the trolley moved considerably faster than the men could walk with their loads, with the result that it was possible to pass the desired number of cores through the door and distribute them in the foundry as wanted. It was also found possible to store approximately a day's supply of cores on racks which were built in the coreroom, in some adjoining passages and in a portion of the foundry.

SUMMARY OF METHODS ADOPTED

The secret of the elimination of this congestion consisted in speeding up the production of the coreroom to obtain part of the floor space for other operations, in providing storage for approximately a day's supply of cores, in providing for bulk handling of the material in such a way that the cores were protected from injury from the time they were inspected until they were picked up by molder for setting in the mold, and by providing for bulk handling of the castings and the storage of a sufficient number outside the cleaning room to relieve the congestion in that department during the early morning hours.

In this case it might almost be said that the original failure of the plant was due to a fatal doorway and its throttling effect. Had the plant been properly laid out in the first place, provision would have been made for bringing the castings to the cleaning room through openings other than that through which the cores and other supplies had to pass.

The total number of foreign-built vessels admitted to American registry under the act of August 18, 1914, up to April 17 is 137, with a gross tonnage of 489,508. The number of sailing, steam and unrigged vessels built in the United States in March was 111, of 24,538 gross tonnage.

The Road to Better Business Conditions*

A Steel Manufacturer on Present Problems—Co-operation the Only Basis on Which the Country Can Get Ahead

BY THEODORE W. ROBINSON†

Commercially speaking, things are and for a long time have been badly out of joint in this country. The present unsatisfactory conditions, while influenced by the war, can by no means be attributed to the war. Our crops have been unprecedented in volume and high in price. Our financial condition was never stronger. Labor and capital are anxious to perform their service. Yet many of our mills are idle, and hunger and want are in our land. Why, then, when our basic conditions are sound, are the energies of our people atrophied, and their activities repressed? * * *

UNCERTAINTY AND FEAR

The answer may be given in two words: uncertainty and fear—uncertainty as to what can properly be done by business and fear that something may be done inimical to business.

There is today general timidity on the part of investors, and we too often fail to realize that the small investors are our true capitalists and that the wealth of this country lies essentially with them. Even our so-called captains of industry are but trustees of the small man's property, and we are all directly or indirectly interested, through our investments, insurance, and daily wage, in the prosperity of incorporated capital, any blow at which strikes the small man infinitely harder than it does the large man. Five per cent. of our people perhaps can live on their accumulated or inherited wealth. The 95 per cent., however, must work; and to be able to work, our industries must be active. It would be well if our citizens more generally recognized these facts, to the end that better co-operation might be had between the Government and the people. * * *

It would be folly for business to deny that abuses crept in with the early centralization of industry, and that if our form of government was to stand they had to be corrected. It would likewise be folly to attempt to justify some of the economic doctrines under which regulation has been attempted, or to excuse the ignorance, if not vindictiveness, with which some of the regulation has been undertaken. We reap what we sow, and in the ignorance and selfishness of the past we largely find the seed that is giving us today our harvest of discontent and industrial demoralization.

DOUBT AS TO FEDERAL LAWS

Twenty-eight years ago the Government, through the interstate commerce law, gave notice that no private interest was above and beyond an obligation to the whole community. Three years later the Government, through the Sherman anti-trust act, began its effort to control or limit combinations between competing companies engaged in commerce. At first the law was construed to prohibit all combinations which directly restrained competition. Then the Supreme Court decided in the Standard Oil and Tobacco cases that the law only condemned combinations which unreasonably restrained trade. Later the International Harvester Company was ordered dissolved by a district court because it had acquired too large a proportion of its special business, and recently, in the Keystone Watch case, a district court refused to dissolve the company because size is not a crime under the Sherman law.

How serious is such uncertainty and confusion need not be elaborated before a body like this. The fundamental difficulty lies in the fact that the Sherman anti-trust law as passed by Congress was largely meaning-

less and experimental, and did not attempt to determine what there might be of good or evil in the trusts at which it was aimed. The practical questions involved in the law and in the decisions that have been rendered under it are essentially economic questions. The law did not advance any principles of economics, and the courts ever since have been trying to determine what principles of economics are good for business. There is certainly restraint of trade, but not of the character intended, and the Clayton bill will not remove the difficulty unless by the hearty co-operation of the Federal Trade Commission and business.

[The railroad situation was then referred to by the speaker and it was pointed out that forcing unremunerative freight rates upon carriers would in the end injure the people whose interests it is sought to protect. The tariff was spoken of as an economic question which should be taken out of politics and business men were urged to co-operate to that end by giving the public the facts.]

GERMANY AS AN EXAMPLE

Germany is a striking example of the power of effective co-operation between government, labor and industry. With but seven per cent. of our land area, and with a population only 60 per cent. as large as our own, Germany's imports and exports before the war not only exceeded those of the United States but surpassed those of all the other nations of the world, excepting only the United Kingdom. Germany believes in industrial centralization, gives freedom to combine as well as freedom to compete, and encourages her industry by a protective tariff. Let us keep clearly in mind that industrial centralization is the modern form of industrial co-operation, and through its unquestioned economy and efficiency, centralization is just as much a factor in increasing a country's wealth as is any other labor-saving device. * * *

I recently had a study made of some of our agricultural accomplishments as compared with those of Germany, and the difference in the yield per acre in the two countries in wheat, oats, rye and barley is strikingly significant. The following figures for this country are based on five year average returns for the years 1910 to 1914 inclusive, and those for Germany are for the four year average returns from 1910 to 1913 inclusive. In the period mentioned where we produced 14.9 bushels of wheat per acre, Germany produced 32.2 bushels per acre. Where we produced 30.5 bushels of oats per acre, Germany produced 54 bushels per acre. Our yield of barley was 24.5 bushels as against Germany's 38.3 bushels, and our production of rye was on the basis of 16.3 bushels per acre as against 28.8 bushels in Germany. But the most striking difference lies in the potato crop, which in this country averaged in value in the past five years \$213,000,000 annually. Our potato crop averaged 97.7 bushels per acre, while Germany produced 202.3 bushels per acre. * * *

The average annual value of the crops in question in the United States, together with corn, amounts to \$2,997,706,000. If our yield per acre had been as good as Germany's yield [in wheat, oats, rye, barley and potatoes] and if we could command an average of 50 bushels of corn per acre [instead of 26], the average value of these crops would have amounted to \$5,844,885,000, or an increase of \$2,847,179,000. In other words, our agricultural wealth obtained from these six crops would have been practically doubled.

ORGANIZED STATE CO-OPERATION

[The co-operation of men of affairs with representa-

*Extracts from an address before the Chamber of Commerce of Youngstown, Ohio, May 4, 1915.

†First vice-president Illinois Steel Company, Chicago, Ill.

tives of labor with the State in providing proper vocational training for the youth of the country, the speaker showed, would add \$750,000,000 per year to our wealth, figuring at 10 cents a day the increased earning capacity of 25,000,000 persons engaged in farming, transportation and other industrial pursuits.]

The Chamber of Commerce of the United States centralizes the influence and activity of many of our national bodies of trade and commerce. Through them it represents at least 200,000 firms or corporations and in addition 50,000 to 100,000 business men. In the last three years its influence in Washington has been beneficial and far-reaching in many matters of national importance; it has a special advisory committee for co-operating with the recently appointed Federal Trade Commission. What is thus being done in respect to federal legislation, we should be able to do in respect to State legislation.

In every State there are many organizations representing commerce, labor, trade and industry, each with its own peculiar functions and duties. It may not be Utopian to suggest that, without detracting from their duties, such organizations could generally unite in each state to form a small non-partisan centralized body for promoting publicity in respect to the men, doctrines and methods involved in State legislation affecting business.

Business has no protest against just and wise supervision. We need publicity as to business methods, but we also need publicity as to the method and character of our business legislation, investigation and control. The personnel of our investigators has often been incompetent and prejudiced, and the character of our control has frequently been predicated upon false and uneconomic doctrines. Adversity, however, is a hard teacher, and this country is ripe for a widespread co-operative propaganda of the truth.

COMING PROSPERITY

This country is blessed beyond all other nations, in its natural resources, and to even a high degree in its peace with the world. Good fortune is seldom builded on the misfortune of others, and it is unsound to predicate prosperity upon the loss of war. Nevertheless, the necessities of Europe and our own enforced economies are rapidly placing us in a position of world-wide leadership in finance and commerce. We shall have to pay our part of the destruction in Europe, but our share will be more than offset by the opportunities that are presented, provided our industries can be quickened by proper governmental co-operation. Let confidence be thus established, and nothing short of a national calamity can stop the prosperity that is knocking at our door.

Germany's Steel and Pig-Iron Output

Germany's production of pig iron in February, according to official data in *Stahl und Eisen*, was 803,623 metric tons, compared with 1,445,670 tons in February, 1914, and 874,133 tons in January, 1915. The March output, as reported by cable, was 938,438 tons, or 134,815 tons more than February. Each month of the war has shown an increase in the daily production except November.

The production of steel in Germany for January was 963,790 metric tons, which compares with 1,602,480 tons in January, 1914. The January output was made up of 503,645 tons of Bessemer ingots, 412,630 tons of open-hearth ingots, 30,401 of steel castings, 9655 tons of crucible steel and 7459 of electric steel. The month's output is 21,826 tons greater than that of December (941,964 tons).

Germany's February output of steel was 946,015 metric tons, which is 17,775 tons less than that for January. The production in February, 1914, was 1,509,785 tons. The February output this year consisted of 489,541 tons of Bessemer ingots, 405,339 of open-hearth ingots, 34,795 tons of steel castings, 7359 tons of crucible steel and 8981 tons of electric steel. The total output to March 1, 1915, is 1,909,805 tons compared with 3,112,265 tons to March 1, 1914.

Milwaukee Shrapnel Case Will Not Hold

WASHINGTON, D. C., May 4, 1915.—There is no probability that an action, either under State or federal laws, can be sustained against the Allis-Chalmers Company which, in a complaint filed under the so-called "discovery" statute of Wisconsin, is alleged to have entered into a conspiracy with the Bethlehem Steel Company and other parties to manufacture and ship shrapnel shells to European belligerents. By order of President Wilson the Department of Justice has made a preliminary investigation to determine the form of the action taken in Milwaukee, whether the Wisconsin law contemplates any measure of restriction upon interstate and foreign trade and whether any phase of the alleged transaction comes within the purview or prohibition of the federal statutes. While the inquiry has not been completed, the officials are clearly of the opinion that no federal law has been violated and that the States have no jurisdiction over the acts alleged to constitute a conspiracy.

The complaint filed in this case by Samuel Pearson, a citizen of the United States, alleges that he has valuable property interests within the boundaries of Germany and that he is the owner of securities issued by the German Government. The Allis-Chalmers Company, the Bethlehem Steel Company and other parties unknown to the complainant are making shrapnel for shipment to the belligerents, presumably for use against Germany. Such a conspiracy, it is claimed, is a criminal offense under the laws of Wisconsin, and Otto Falk, of the Allis-Chalmers Company, and others are cited to appear before the Circuit Court Commissioner in Milwaukee for an examination in order that the names of all the parties to the transaction may be obtained. The law officers of the Government are inclined to believe that this action has been brought by some zealous person for the purpose of drawing attention to the desirability of placing an embargo on all forms of arms and munitions of war, such as the President has repeatedly been urged to impose.

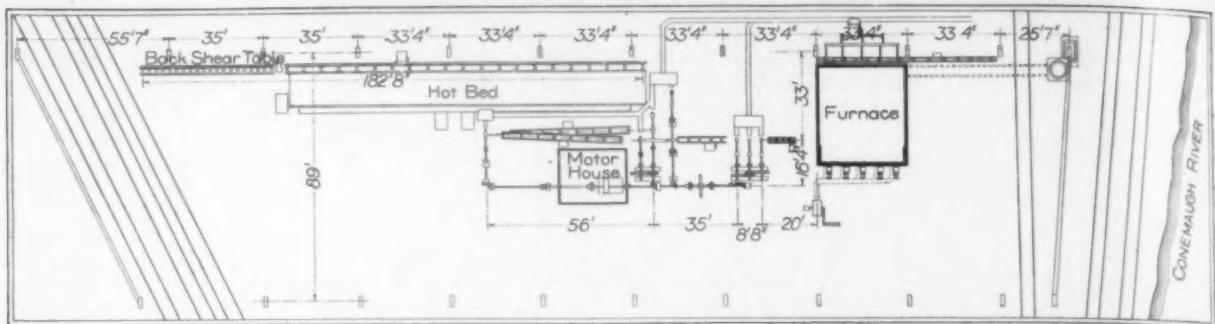
W. L. C.

Grönwall Electric Furnace at Detroit

An electric furnace installation is being made in Detroit, Mich., by the John A. Crowley Company, of New York, of a six-ton unit of the Grönwall type, now being used by Sheffield (England) mills for producing high-grade steels and castings. It will be the first installation of this type in this country and will be producing steel about May 10. The furnace operates on a two-phase circuit with two electrodes, each phase being connected to one of the electrodes, the circuit being completed through a neutral pole embedded under the lining of the hearth. This method carries the current through the bath and causes sufficient motion of the molten metal to effect uniform heating and complete distribution of any alloys that may be added.

The Edgar Allen American Manganese Steel Company, Chicago, announces that it has at various times received suggestions from both customers and those from whom it makes purchases that its incorporated name is more or less awkward for use in preparing orders, rendering bills, drawing checks, addressing telegrams, letters, etc. After due consideration of these conditions and others, a change in name has been legally authorized which became effective April 15, and it is now the American Manganese Steel Company. No change other than the change in name is involved, but the same personnel and management under which the business has been developed will continue to conduct it under the policies which have heretofore prevailed.

A formaldehyde paint possessing, as its name indicates, the properties of a disinfectant and adapted to the covering of the walls of shop toilet rooms, is produced by the Standard Oil Company. It has a secondary usefulness in that it renders a protracted occupancy of the room decidedly uncomfortable though its effects are quite harmless. It has been recommended by State boards of sanitation.



Cambria Steel Company's New Bar Mill

Recent Installation of a 9-In. Unit at the Gautier Plant—Features of the Slick Type of Furnace Roof and Cooling Bed

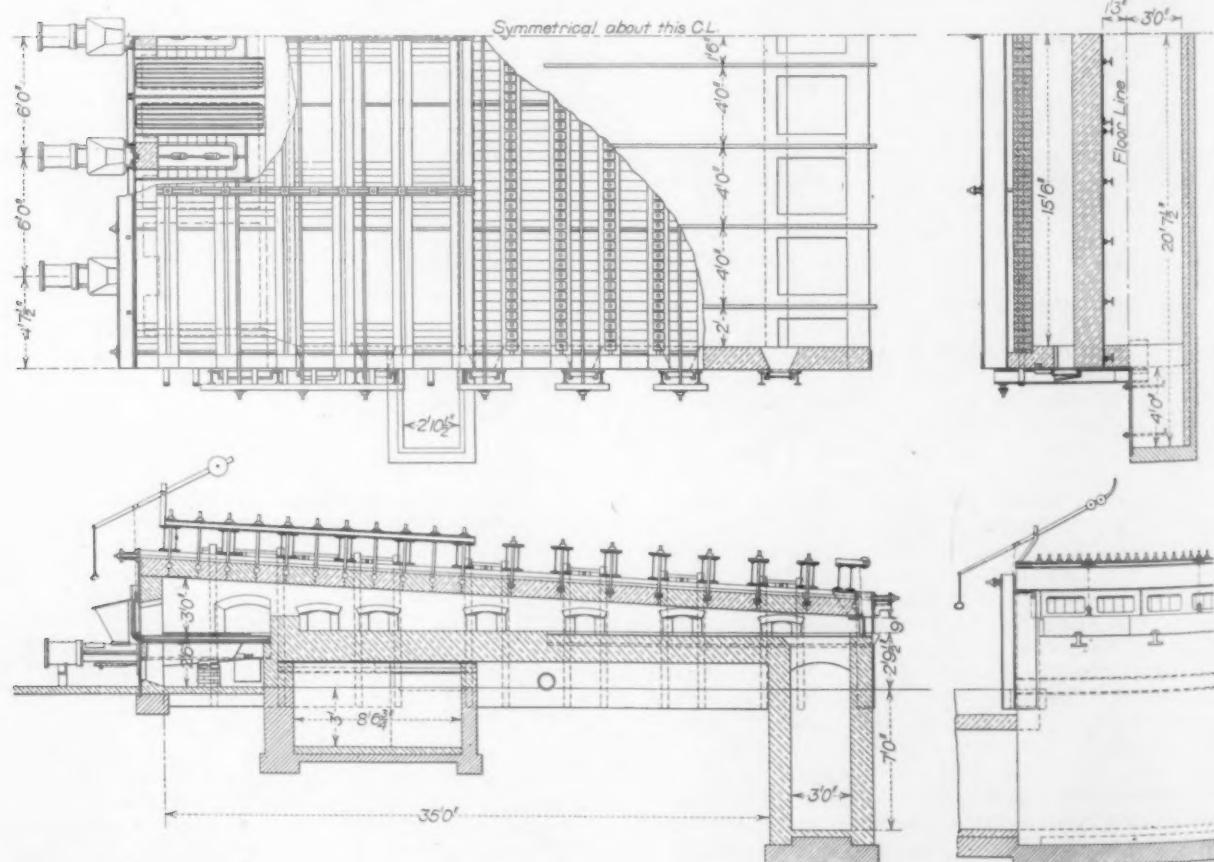
Recently the Cambria Steel Company completed and placed in operation at its Gautier works at Johnstown, Pa., a new 9-in. bar mill. It has a capacity of about 50,000 tons per year, consisting of smooth finish bars, ranging in width from $\frac{1}{8}$ in. to 2 in., and small angles and channels.

The general layout of the new bar mill, as indicated by one of the illustrations, consists of four stands of 10-in. roughing rolls arranged for continuous reduction, followed by four stands of 9-in. rolls, two of which are three-high. The mill is driven by a 1000-hp. motor through gearing.

The heating furnace is of the continuous type with Slick patented flat roof, five automatic under-feed stokers, electric charging pusher with automatic door closing device and a set of pinch rolls for discharging the stock through the side of the furnace. It is 31 ft. wide and 35 ft. long. The

fuel used is a mixture of coal and coke breeze. The Slick roof being perfectly flat and free from arches allows an even distribution of heat and a uniform velocity of gas passing over the steel. The roof also has an advantage over the flat roof type in which the bricks are supported on water cooled pipes, in that the girder brick, having greater depth than width, give the desired stiffness for supporting the roof sections. At the same time the water cooled portions of the girder brick afford an opportunity for a relatively large cooling surface.

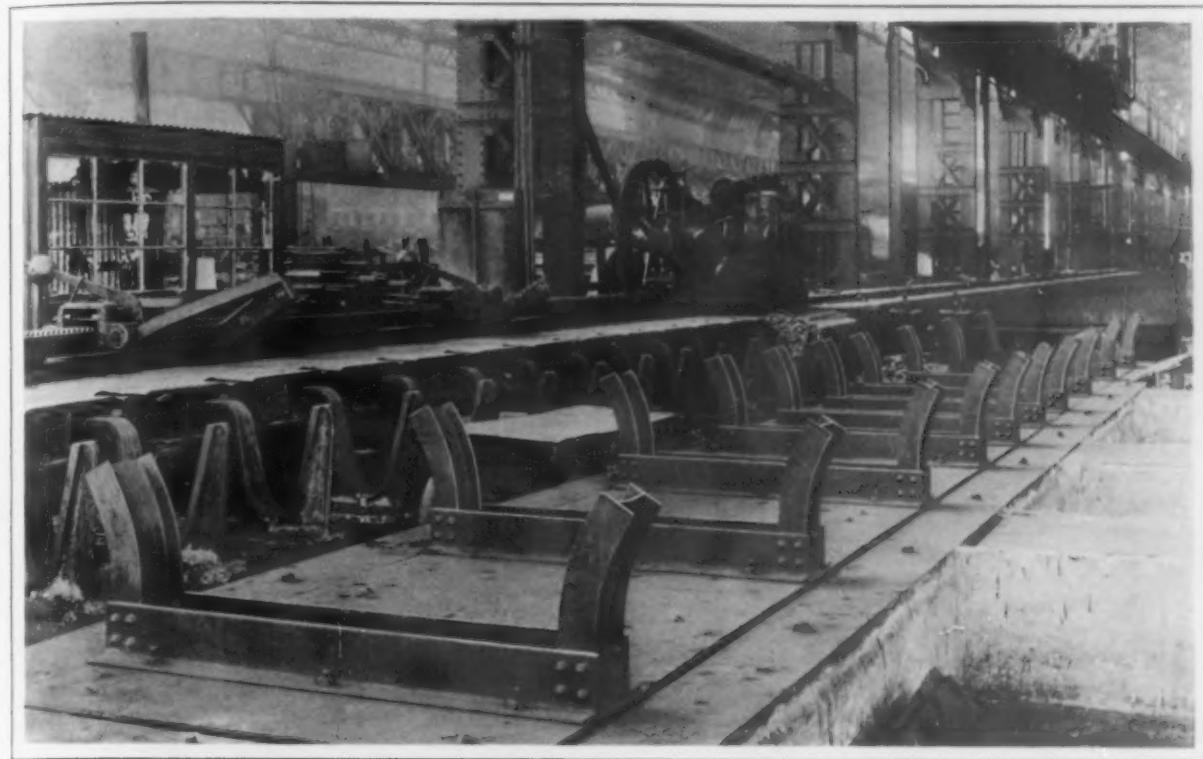
With this roof it is only necessary to apply the water cooling for about one-half the length of the furnace, the balance of the brick being supported by bolts and washers at each end of each brick. The roof is carried on the furnace walls and no side buckstays are required except such as are necessary to support the door frames and doors. In



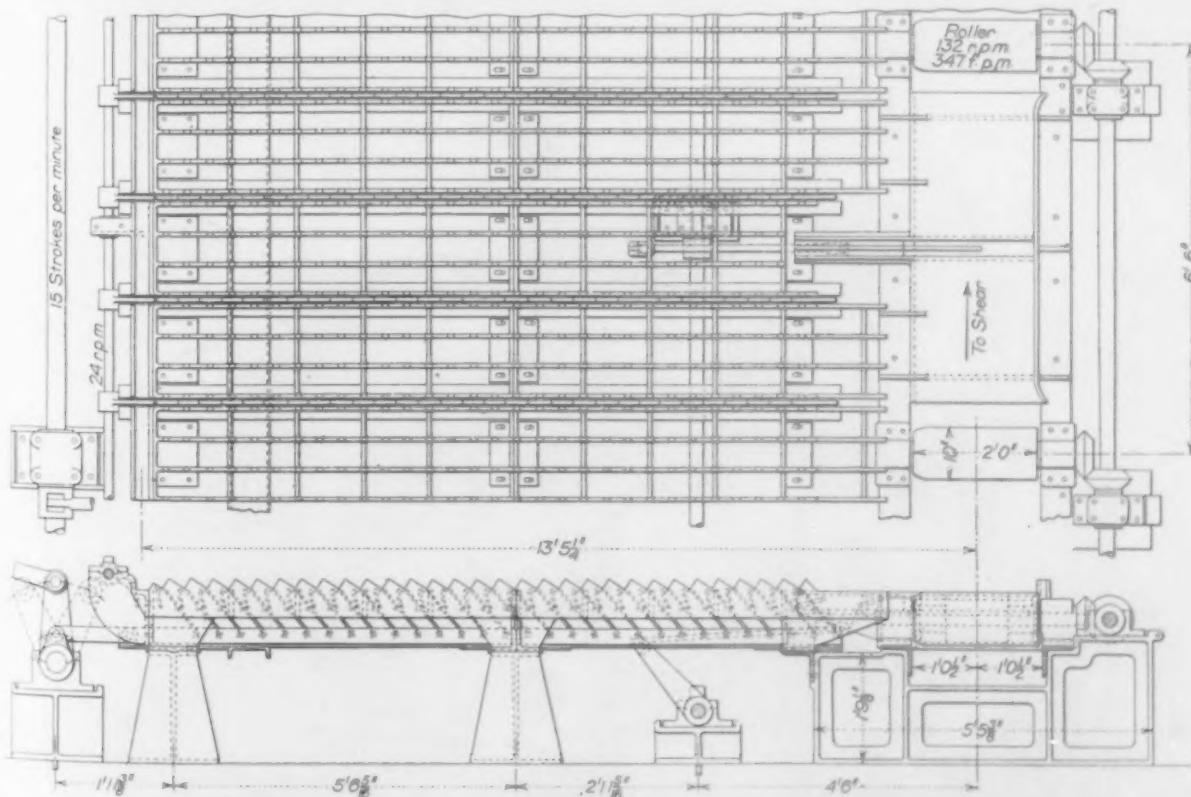
The Continuous Type of Slick Heating Furnace in Cambria's New Bar Mill

case of repairs only a small section need be torn out at one time and it is possible to replace a single brick. The furnace walls can also be repaired or rebuilt without disturbing the roof. This furnace has a flat hearth without water cooling, the billets being carried for about 15 ft. on cast-iron ties

without the necessity for further straightening. This type of bed is constructed of cast-iron sections and is 130 ft. long and 13 ft. 5 $\frac{1}{4}$ in. between the center of the run-out trough and the center of the shear table. The receiving side of the bed is securely bolted to the stands, while the other side of



The Shear, Gauge, Etc., of the New 9-In. Bar Mill of the Cambria Steel Company



The Slick Cooling Bed at the New Bar Mill of the Cambria Steel Company

imbedded in the bottom, after which they are pushed over the brick hearth.

The Slick cooling bed, shown in the illustration, is a distinct advance in capacity and simplicity of construction and has attracted attention for the low cost of up-keep and the ability to cool the bars

the bed is free to move, thus permitting the cooling bed structure to expand without disturbing the alignment.

The movement of the bars is obtained by fingers operated by a series of sliding connecting angles in pairs. As the bars slide into each successive

notch they fall with sufficient force to straighten any irregularities. It is possible, without reducing the cooling effect, to obtain a large increase in capacity for the same surface over the average mechanical bed. In connection with the cooling bed are a shear, shear table and scales for making direct shipments.

The mill is covered by a modern building with steel frame and corrugated steel roof and is served by a 15-ton single-trolley traveling crane.

A 100-IN. DRIVING WHEEL LATHE

Axles Handled by Overhead Pneumatic Hoist— Recesses in Face Plates Drive Work

A driving wheel lathe of unusual dimensions has recently been completed by the Niles Tool Works Company, Hamilton, Ohio, for shipment to Roumania. It has a swing of 100 in., and is built along the lines of the company's standard 90-in. tool, but with modifications to suit the customer's special requirements. The machine is arranged to handle wheels from 32 7/10 to 94 1/2 in. in diameter on the tread, with a maximum distance between centers of 11 ft. 2 1/4 in. The minimum obtainable distance between the face plates is 6 ft. 8 in.

The bed, which is of massive construction, is 22 ft. long. The front portion, upon which the carriages rest, is moved out 10 1/2 in. from the main bed. Wheels with outside cranks can be rolled into the machine on tracks located on the bed, and it is pointed out that as the maximum distance between face plates is 11 ft. 2 1/4 in., the cranks will not interfere with the driving dogs on the face plates. The rear T-slot is extended to the left face plate

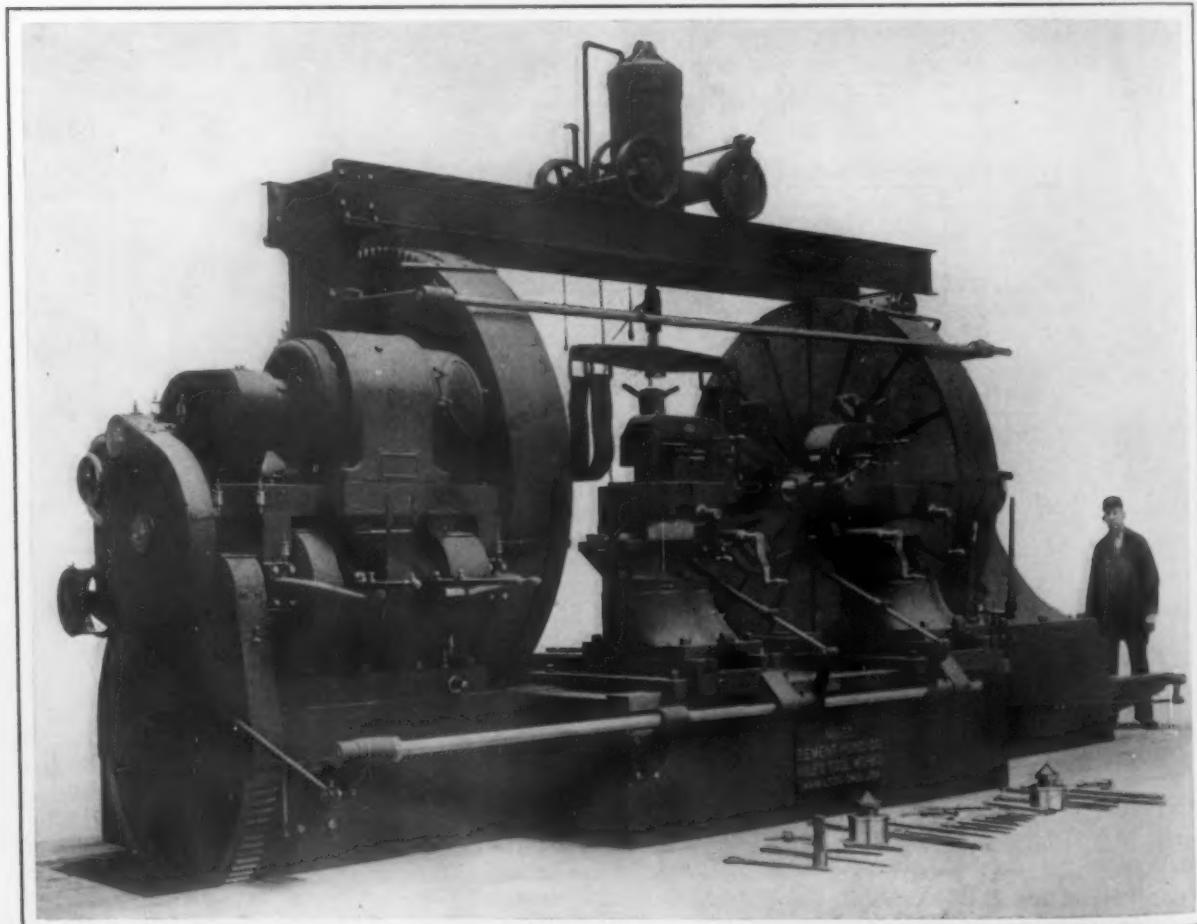
to provide a place in which the bolts for the carriage can be located if a journal turning attachment should be ordered at some future time.

The face plates, which are 100 in. in diameter, are arranged with recesses for admitting the outside cranks of driving wheels. The face plates are driven by large-diameter gears bolted to their back faces. The driving gears which engage the face plate gears can be thrown out of mesh with the latter so that the speed of the left hand face plate can be increased through an auxiliary train of gears when the machine is used for journal turning. Two carriages are mounted at the front of the machine and have two extra heavy tool rests, the bases of which are arranged to swivel to give the proper angle for the taper of the wheel tread. The tool rests are equipped with pneumatic tool clamps so that the tools can be changed almost instantly. Power feed for the tool rests is provided through a rocker shaft shown at the front of the bed.

The headstock is directly connected to a General Electric 30-hp. adjustable-speed motor, having a range of 500 to 1500 r.p.m. In addition the gear arrangement provides for four additional speeds, giving a range of speed for turning tires of from 10 to 25 ft. per min. for all diameters of wheels.

The spindles have noses projecting 3 in. into the face plates so that the overhang of the sliding spindle is made as short as possible when turning small wheels with outside journals.

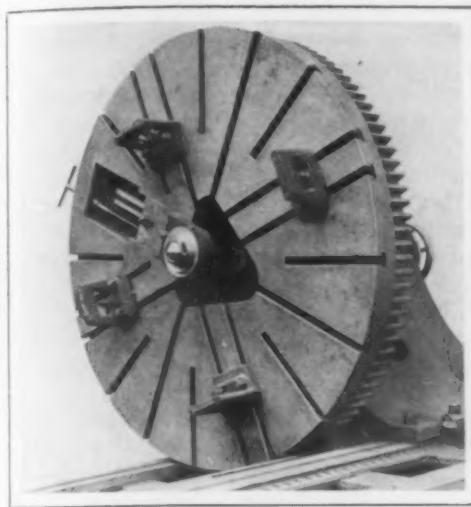
One great labor saving attachment provided for the lathe is a Curtis pneumatic hoist that is carried on two 12-in. channels located above the machine. The hitch to the axles is made by using two slings made of belting, instead of the hooks that are generally employed. With the use of this hoist the wheels can be placed in position in a short time as



A 100-In. Driving Wheel Lathe That Has Been Shipped Abroad Recently. The Wheels Mounted on Their Axles Are Handled by a Pneumatic Hoist and Are Held in Place by Their Outside Cranks Which Enter Recesses in the Face Plates

compared with former methods for placing work of this character.

The equipment furnished with the lathe includes an Andrews caliper attachment. This attach-



A Nearer View of One of the Face Plates Showing the Recess for the Outside Crank and the Driving Gear Which Is Bolted to the Back

ment consists of scales countersunk in the carriage and fastened to the tool slide base, together with a bar for setting the roughing tool.

Low Sulphur Malleable Castings

In order to overcome the difficulties resulting from the presence of relatively high sulphur in malleable and other castings, a patent (U. S. 1,132,661—March 23, 1915) has been granted to William G. Kranz, of the National Malleable Castings Company, Sharon, Pa., which relates to the treatment of iron intended for such castings. The presence of 0.06 to 0.10 per cent. sulphur causes considerable loss of malleable castings from cracking. The use of low-sulphur pig iron, which is expensive, has been the only remedy. The invention permits the use of any grade of iron or scrap. The materials are melted at a relatively low heat in a cupola, open-hearth or air furnace, the cupola being preferred. The melted product is charged into any desirable type of electric furnace, arc or induction. Lime is added, preferably burnt, and the temperature raised to remove the sulphur in connection with carbon additions. Enough carbon is added to the previously tested pre-melted material so that after the oxides are practically eliminated, the carbon will react with the lime to form calcium carbide. When the temperature is sufficiently high the sulphur is largely reduced or practically eliminated. When the carbon is low in the melted material, sufficient carbon is added in the electric furnace to raise it to about the percentage desired in the product. Alloying metal such as titanium or vanadium can also be added, the loss being minimized because oxides have been removed. The metal, which is white iron is poured into molds and malleabilized in any desired manner. The product from this process contains from 1.50 to 3 per cent. carbon, 0.50 to 1 per cent. silicon, 0.05 per cent. sulphur or under and 0.50 per cent. manganese or less.

Air storage tanks for garages have come in for a discussion in the monthly publication of the Travelers' Insurance Company, Hartford, Conn. Special attention is called to the fact that too often ordinary hot-water kitchen tanks are used though they are not designed of course to at all withstand the pressures of 150 to 200 lb. not uncommon in the modern practice of supplying air for automobile tires.

The Crown Die & Tool Company has removed its office and shipping room to 435 West Washington street, Chicago.

A MACHINE SHOP DOOR GUARD

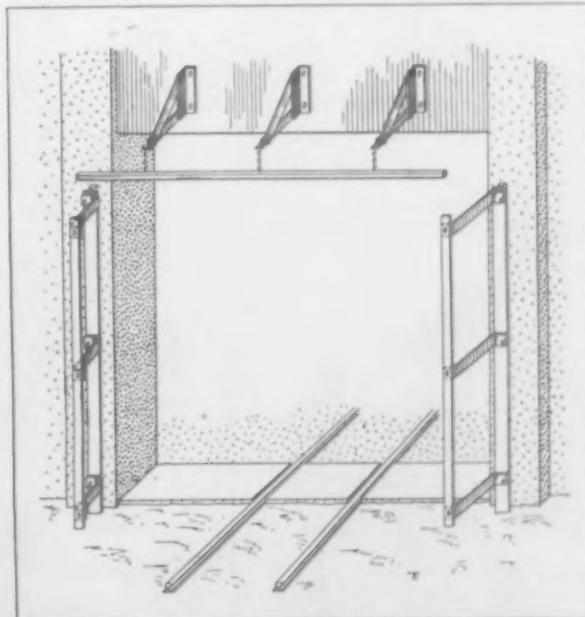
Device To Prevent Damage to Walls by Overhanging Loads on Railroad Cars

BY SIDNEY K. EASTWOOD

The sketch shows a set of guards which was built by one shop around the door through which a railroad siding entered. Before they were put in place a section of the wall around the door was torn out by some heavy castings on a flat car which were loaded too high and which overhung too much on one side. In the sketch the guards are shown on the outside of the door only. They were, however, placed on the inside also.

The guard placed at the top consisted of a 1-in. square bar a little longer than the door opening suspended by three chains to a level about 2 in. below the top of the door frame. These chains were dropped from brackets made up of structural material and securely fastened in position above the door. The guards at the sides of the door were made of light flat stock and extended out from the building about 3 ft. These frames were fastened to uprights located at the building wall. In this case railroad rails were employed for the uprights. These guards were set so that their outer edges were in line with a point about 2 in. inside the door jambs.

This combination of guards above and at the sides of the door gave a means of determining whether a car was loaded so that it would clear the door when the load got within 3 ft. of the wall. If the load would not clear the bar above was struck or else one of the frames on the side bent up so that the man in charge of moving the cars could see before the load had a chance to strike the wall and damage it that the load would not clear the doorway. This gives plenty of opportunity to stop the car and rearrange the load before



A Guard for Machine Shop Doorways Which Is Intended to Prevent Damage to the Building Wall from Overhanging Loads on Railroad Cars.

any damage is done. It is an easy matter to straighten up the guards at the sides again and is a much more economical proposition than rebuilding a wall every time a car happens to hit it. These guards are especially of value in plants where large steel castings and ingots have to be moved in and out of the shops.

TWO NEW ELECTRIC TOOLS

Combination Upright Drilling and Bench Grinding Machine and High-Speed Drill

A combination electric drilling and grinding machine and a small high-speed universal electric drilling machine have been brought out by the Van Dorn Electric Tool Company, Cleveland, Ohio. The first machine can be used either as a portable or a bench drilling and grinding machine, while the other is intended to be employed for the rapid production of work which a small portable drilling machine can handle.

The combination machine is designed for a wide range of work, including use in garages and for repair work on boats, being a general service machine that eliminates the use of belts, pulleys and shafting. It is intended for operation on either 110 or 220 volt direct-current circuits. As it is equipped with a constant-speed motor it is adapted for other purposes in addition to drilling and grinding. To provide low speed for drilling, the drilling end is geared down to a constant speed of 550 r.p.m. Its drilling capacity is $\frac{1}{2}$ in. in steel. A $\frac{1}{2}$ -in. chuck, fitted with a No. 1 Morse taper shank, which fits into the socket of the machine is furnished, thus permitting the use of either taper or straight shank twist drills. The regular equipment includes a spade handle, breast plate and feed screw.

The machine is convertible into an aerial or portable grinding machine by fitting it with a self-contained grinding attachment, the grinder head at the opposite end from the drill end being interchangeable with the spade handle, feed screw and breast plate. The grinding attachment is directly connected to the armature shaft, a constant speed of 4500 r.p.m. being provided at the grinding end. It uses a wheel 6 in. in diameter having a face measuring $\frac{5}{8}$ in. in width.

In order that the machine may be used as a bench grinder the company has brought out a bench grinding stand to which it can be quickly attached by a stud and nut, after the side handle is removed. In its position on the bench grinding stand it can be used as a buffing lathe head, and a spiral spindle to be screwed on the emery wheel spindle is supplied as a special attachment for holding a loose, sewed felt or wood core buffing wheel.

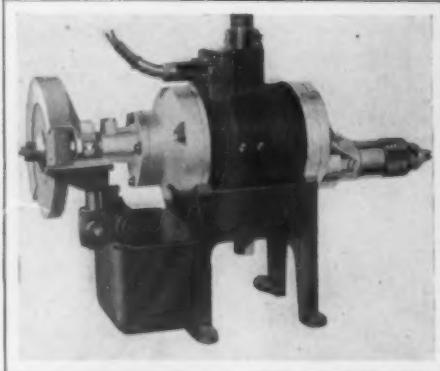
To convert the machine into a bench drilling machine, a special stand is pro-

vided. After the removal of the side handle it is mounted on the stand by an adapter plate and held securely in place with a stud and nut. This stand is provided with a hand lever feed, a spring for drawing the drill back from the work when the lever is released and an adjustable table. The stand can be used in connection with other types of the company's portable drills for drilling up to $\frac{5}{8}$ in. The machine can be swiveled to a horizontal position on the drilling stand so that it can be used for grinding without removing it from the stand.

The bearing for the grinding head is designed to permit its adjustment to the shaft, means being provided for compressing as well as expanding the bearing for the desired running fit. This is accomplished by a pressure cap which when loosened from the adjusting nut and bearing bushing will permit movement in either direction. When the proper adjustment is secured the pressure cap is again tightened to hold the bearing in place. Longitudinal adjustment is effected by a double end twist bearing which is provided with a dial cap. By depressing a poppet pin this dial can be moved in either direction to obtain the desired adjustment. High grade ball bearings are used at both ends of the armature shaft. The gears are of special alloy steel hardened and ground. The switch is of the quick make-and-break type. Owing to the fact that one of the handles can be removed, the machine can be used for drilling close corner work. Other advantages claimed for it are that it is easy to adjust and to take apart for cleaning and its maintenance cost is low.

The universal electric drilling machine, which is the other new product, has a capacity for drilling holes in steel up to a maximum diameter of $\frac{3}{16}$ in. It is $3\frac{1}{2}$ in. in diameter, $11\frac{1}{8}$ in. long, weighs $6\frac{1}{2}$ lb. and has a speed of 2000 r.p.m. with no load. Although designed for use on a 110 or 220 volt direct-current circuit, it will operate on either direct or alternating current. On alternating current any frequency ranging from 20 to 60 or 80 to 125 cycles, single or split phase, can be used. Special-voltage machines ranging from 80 to 250 volts are wound to order.

The machine is equipped with a chuck to take straight shank 0 to $\frac{3}{16}$ -in. twist drills. It is provided with a pistol grip handle and has an automatic or locking type of control switch which is located in the upper head,



Two New Portable Electric Tools. At the Left Is Shown a Portable Electric Drilling and Grinding Machine in Use as a Drilling Machine with the Grinding Wheel Removed and in the Central View the Same Machine Is Mounted on a Bench for Grinding. The Tool at the Right Is a Portable Universal Electric Drilling Machine.

where it can be readily controlled by the thumb of the operator. The armature revolves in high grade ball bearings. The spindle is offset so that the machine is well adapted for very close corner work. The machine can be used for a variety of work such as drilling name plate holes for machines, sheet metal work, piano work and assembly drilling.

The Copper Market Situation

The increasing demand for copper and the rapid rise in its price have attracted the attention of business men generally. In fact, few of those who are actively engaged in manufacturing or commercial pursuits are without some direct interest in copper, either as consumers of the metal or as holders of copper company shares. We present below comments on the situation by a large consumer, the National Conduit & Cable Company, as given in its Copper Gossip under date of April 20, and of an important producer, Adolph Lewisohn, as given in the *Annalist*, New York:

THE CONSUMER'S OPINION OF THE MARKET

"The outstanding features in the copper situation are the recent heavy foreign shipments of the metal leaving this country and the bigger demand coming from domestic manufacturers. The world markets have become hungry for copper and all eyes are turned to the United States for the great bulk of supplies needed to maintain the pronounced international activity which has developed in all consuming quarters during the last four months. The volume of copper now going into consumption and the celerity of the market advance are the surprising developments which make the present copper situation one of extraordinary interest.

"The trend of the market seems to foreshadow both strength and activity for at least several months. Recent heavy exports gave support to the market, and the distinct betterment in domestic demand also helped values to an important degree. Production has probably increased to 75 or 85 per cent. of capacity, and mines and refineries are undoubtedly preparing to operate up to the normal scale, provided present favorable conditions continue. The market has advanced steadily for over two months without any reaction at this center and only a few slight setbacks in London during the same period. The record of the last two months in copper and the broadening out of demand present a most remarkable history of important movements in this metal. It is obvious that the recent display of strength rests largely on the actual expansion of consumption coming at a time when production was running under normal. If absorption of output can go on with the latter driven to full capacity the exhibition of market strength may be expected to rest on a substantial foundation. As we go to press the market displays increasing firmness and some symptoms of feverishness. Higher prices seem inevitable in the face of persistent heavy buying."

THE PRODUCER ON THE EFFECT OF HIGH PRICES

"In one respect the situation seems to be fundamentally different from any previously developed. Heretofore, rising prices have tended to check consumption, because a certain proportion of industry would find it unprofitable to use copper at the higher prices, and, as a consequence, the substitution of some other metal in certain of the industrial arts would occur. This does not hold true now, however. The belligerent nations must have the metal regardless of price. I am inclined to think, also, that there has recently been more buying for other industrial requirements, reflecting the improvement in business.

"When peace is restored general business will probably be good and prosperity will gradually follow. How far the cessation of war orders will be counterbalanced by the improvement in general business, which is likely to take place on account of rebuilding and restoration that will be necessary when the war ends, and the greater confidence that will naturally prevail, I can-

not tell. We might assume that the one will counterbalance the other. Germany, particularly, has been unable to replenish its supply of copper to any large extent during the war, and when the war ends will probably find its stock entirely exhausted. Other European countries, too, may then have but a small amount of the metal available for industrial uses.

"It follows, therefore, that when the replacement of property destroyed by the war commences, the demand for copper will be very great; and while high prices may result in other metals taking the place of copper to some extent, the possibilities of such substitution are, after all, very limited, and can scarcely be so extensive as to have any very material effect on the market for the metal. To sum up, it looks as if the market is likely to go even higher, or, at least, to remain at the present level, and not likely to go lower for some time to come."

Customs Decisions

IMPORTATIONS BY TRADE SCHOOLS

The Board of Education of the city of New York has been sustained by the Customs Court in its claim for free entry of tools and apparatus for trade schools. The merchandise consisted of scissors which were assessed for duty under paragraph 152 of the tariff of 1909, in which they are specifically mentioned. Under the provisions of paragraph 650, which grants free entry in the case of utensils, instruments, etc., imported for the use and by the order of a college, academy or school, the Board of Education contended that these articles were not dutiable. In answering the Government's argument that this applied only to articles of a "philosophical or scientific" character, the court remarked that the sole criterion in such cases is whether the articles are imported in good faith for schools. Upon the reasoning in this case, the court decides that sewing machines imported for the Boston Trade School for Girls are entitled to free admission.

AMERICAN TIN PLATE EXPORTED AND RETURNED

The failure to file promptly an oath by the importer, owner or consignee of goods which have been exported from the United States and are later re-imported, stating that there has been no advance in value or improvement while abroad, is held by the Customs Court to be sufficient cause for refusing to allow the goods to enter duty free. While an oath or declaration to this effect on the part of the foreign exporter and the importer establishes the right to free entry, the regulations do not permit the collector to waive the filing of the importer's oath or declaration which should be filed at the time of entry. In the case of the foreign exporter this is often impracticable and a bond may be given for its production.

GALVANIZED IRON STRIPS AND STEEL WIRE

The Board of United States General Appraisers has taken adverse action on protests by William Larzelere & Co., Philadelphia, relating to the classification, under the tariff act of 1909, of galvanized iron strips. They were returned for duty at 45 per cent. as manufactures of metal, and were claimed properly dutiable at lower rates under paragraph 120, as shapes of rolled or hammered iron. An examination of the samples convinced the board that the collector made no error in the classification.

Another decision made by the board dealing with the act of 1909 concerned importations by J. P. Lavigne, New York, consisting of half-round and flat steel wire. The custom house authorities took duty at 45 per cent. as metal manufactures, while the importer claimed 35 per cent. or other rate under paragraph 135, according to gauge. The record contained no evidence as to the gauge of the wire. In overruling the protest, Judge Fischer points out that the Customs Court of Appeals has held that the first proviso to paragraph 135 does not establish 35 per cent. as a primary rate, but does establish it as a minimum rate. On authority of that ruling, the present protest was overruled and the collector affirmed.

The Philosophy of Correct Purchasing*

The Buying of Factory Supplies Regarded as Merely One Part of the Larger Problem of Stores Control

— BY ELIHU CUNYNGHAM CHURCH† —

The problem of correct purchasing is the most interesting and the most important subject before the business men of this country. In the first place, it largely governs the economy of all their expenditures except rent and payroll. In the second place, it should control their selling policies. Goods are only sold because some one else wants to buy them. Thus the customer's purchasing problems fix and determine the manufacturer's selling problems. To sell properly one must know and meet the requirements of those who buy. To talk of a sales policy except in terms of the purchaser's buying policy is foolish.

The philosophy of correct purchasing has been formulated under four divisions, as follows:

THE MOST SUITABLE MATERIALS SHOULD BE PURCHASED

Endeavor should be made to standardize the grades and qualities of materials purchased and to specify the purposes for which they are to be used. Thus the disadvantage of having a multiplicity of styles and types of stock will be done away with; and the supplies will be bought on their merits as determined by the investigation of men competent to pass on the subject. The results of the purchaser's testing laboratory rather than the mere opinions of employees in the operating departments should be the controlling factor. Experts having decided that certain materials are best for certain purposes, their use should be insisted upon.

This standardization simplifies the drawing of requisitions; it reduces the work of the purchasing division; it lowers costs as it permits the combination of various requisitions for materials to be used for a similar purpose and the purchase of the lot at one time at wholesale rates; it reduces the labor of making inspections; it requires less money to be invested in stock, and less stock to be stored, looked after and accounted for. Furthermore, stock moves correspondingly faster and there is less loss from depreciation.

The purchaser's requirements should be understood by every manufacturer, that he may set about meeting them scientifically. This is being done more and more. In consequence the technically trained man has established himself in the selling forces of the most progressive concerns where his reports and suggestions largely determine the goods his company produce.

QUANTITY OF PURCHASE SHOULD BE DETERMINED

Estimates for the purchase of current supplies should be based on future needs, not on past orders, for it often happens that busy or careless officials get in the habit of duplicating previous requisitions irrespective of changed conditions and requirements. The proper determination of these quantities may well be made the subject of investigation by staff experts. They should plan for the nature and quantity of work to be done in the future, and should report on the rate at which supplies have been consumed in the past. Such outside investigations can

generally suggest many economies and can point out the faults that develop all unconsciously in even the best of organizations.

In buying each item should be considered separately. The ease with which money can be obtained, the possible fluctuations of the market prices of the goods, their keeping qualities, the likelihood that there may be sudden or unusual demands for them—all these matters should determine the amount of the order. The following reasons for laying in either large or small quantities at one time should be assigned relative values and the amount to be purchased carefully calculated in accordance with such figures.

Advantages of Buying a Large Quantity of Any Material at One Time

It enables advantage to be taken of wholesale rates. It results in orders of such size that manufacturers will bid direct. Middlemen's profits are eliminated. The purchaser secures the advantage of the proportionately lower delivery costs where large quantities of goods are handled at one time.

It accumulates sufficient stock at times when prices are low to last over until low prices occur again.

It reduces the work of the purchasing division, as it is easier to attend to a few large orders rather than a lot of little ones.

It reduces the cost of making inspections by decreasing their number.

Disadvantages of Buying a Large Quantity of Any Material at One Time

It requires room to store goods and space is valuable. It costs money to exercise a proper supervision and care over goods in storage.

The interest on the money tied up in unproductive material is a direct loss.

Insurance and taxes add to the expense of storing goods.

There is often deterioration of stock due to too long storage.

LOW PRICES SHOULD BE OBTAINED

Having settled upon the most suitable material which to purchase, and the quantity which it will prove most economical to buy at one time, it now behoves the purchasing agent to secure it as reasonably as possible. Prices are fixed by the seller, not by the purchaser, and depend on a great many conditions other than the mere value of the commodity. A careful study of these conditions will show the purchaser the circumstances that will enable him to obtain the lowest figures.

The selling expense of a large sale is generally about the same as that of a small one. When large quantities of goods are bought at one time wholesale prices are secured. In order to take advantage of this the purchaser should combine his requisitions for similar materials, and buy all together at one time, instead of continually running into the market for small quantities at irregular intervals.

It should be recognized that manufacturers and large dealers often handle goods of but a single kind. If bids are to be secured from them direct, rather than from middlemen, tenders must be requested for these different classifications separately.

The cost of meeting special requirements is generally excessive. Consequently standard materials should always be specified whenever it is possible to do so.

Nothing is more apt to cause a high bid than indefinite specifications. Adjectives and adverbs have no place in a specification. To say that goods must be "suitable" or "first class" without then describing fully and accurately what constitutes "suitable" or "first class," or to require that an undertaking

*From a paper read before the National Association of Cotton Manufacturers, Boston, Mass., April 28.

†Consulting engineer, 4 East 130th street, New York.

shall be done in a "workmanlike" manner, or "to the satisfaction of somebody-or-other," merely causes the bidders to increase their figures in self-defense, and the buyer pays for this so-called insurance against himself.

Where manufacturers are given leeway in the time for commencing deliveries they can often quote much lower figures than where the goods are wanted "at once."

RELATION OF PURCHASING TO STORES CONTROL

Correct purchasing is not merely a matter of buying. The work of the purchasing agent should begin before the requisition is drawn, and should continue after the goods have been bought, delivered and inspected. He should see that the goods are properly stored and issued, that they are put to the use intended, that they are used efficiently, and that they are kept in service till worn out.

Much Unnecessary Material is Bought

While a purchasing agent is haggling over some slight difference in price he may be unaware that the supplies he is bargaining for are quite unnecessary; in fact, that there are already plenty on hand. This will often happen where improper storeroom methods and the absence of the necessary records fail to reveal the conditions.

Too Expensive Supplies Are Often Ordered

Perhaps while all the agent's attention is being given to this small difference in price it may be that the man ordering the supplies in question specified qualities and grades superior to the requirements of the work to be done. Without standard specifications based on the actual conditions to be met it is easy to buy materials that cost double what is necessary.

Many Requisitions Are Excessive in Amount

Again it may occur that considerations of price so monopolize the attention of the purchaser that he does not realize that carelessness in the estimating department has resulted in an excess of material being ordered. Buying even a little extra material which is not needed and will not be used may offset the most painstaking price shaving ten to one.

Market Conditions Are Often Ignored

Perhaps when supplies are bought they are bought as cheaply as possible, yet it frequently happens that lack of forethought makes it necessary to go into the market when conditions are unfavorable and prices high—just because no proper attempt had been made to estimate the future requirements of the business.

Poor Storeroom Methods Cause Loss

Improper care of supplies and careless methods of storage and issue lead to losses due to deterioration, waste and theft that counterbalance the possible savings due to careful purchasing many times over. An improperly conducted storeroom is capable of producing greater and more different kinds of loss and annoyance than any other one spot.

Use of Supplies May Be Wasteful

High grade materials are invariably issued by careless men in charge of supplies if the cheaper article called for is not in stock or convenient to get at. The difference in price between the material actually used and the material that would have served the purpose is a clear loss.

If supplies are not used efficiently and economically the quantities requisitioned will be excessive.

This excess is an absolute loss, it is a direct loss, and it is generally a very great loss. For instance, if a boiler room is so managed that the coal only produces 80 per cent. of the steam that it should—it simply means that your bill for coal is 25 per cent. greater than necessary. Similarly for all supplies. It is "straining at a gnat and swallowing a camel" to direct all one's attention to the price of the material purchased—and then permit it to be used inefficiently, uneconomically or wastefully.

SUMMARY

In summing up, it may be said that the philosophy of correct purchasing consists in getting the right materials, in proper quantities, at a low price, and with as little cost for the doing of it as possible.

Finally, the fact must be emphasized that purchasing is but one part of the larger problem of stores control. No matter how well the mere purchasing function is carried out the losses from improper methods of drawing requisitions and from unscientific inspection, storage, issue and use of supplies may more than offset all the savings in power plant, factory and office.

The Outlook at Kansas City

KANSAS CITY, Mo., April 28, 1915.—When it is stated that the estimate of one of the leading architects of this city places the value of building projects now under consideration at \$20,000,000; that one maker of sheet metal products used on the farm and in farming communities reports its business as 18 per cent. better for the period since February 1 than for the same period in 1914, and that present conditions point to unusually good crops, there is reason for the confidence here in the future of 1915. The farmers of the Southwest, for whom this city is so largely a distributing center, are wealthy, but do not make heavy commitments against uncertainties of harvest and they do not need to, as the makers of metal silos, metal grain bins, metal feeding troughs and other numerous metal articles used in farming districts—not to overlook the corrugated metal culvert now exceedingly popular—keep good stocks and are exceptionally resourceful in manufacturing capacity. The result is the demand really comes only when the farmer is sure he is taking no chances; and the manufacturer and the distributor (who far outnumbers the manufacturer) have both to be close students of crop conditions, while in times when there is no buying they devote themselves to the educational campaign.

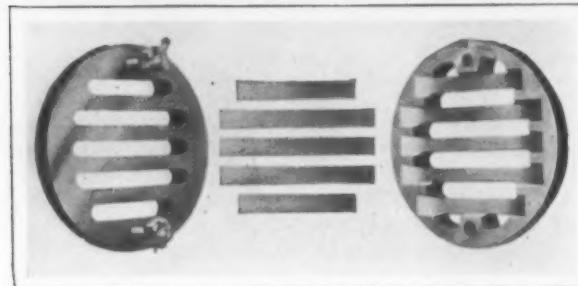
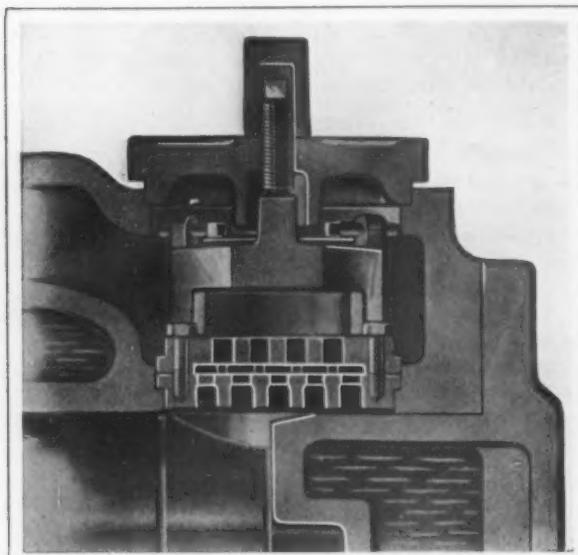
The prospects for Kansas City look bright. There is no evidence of overbuilding and the surprise is that with the decided change in sentiment building work has not already been put out for figures in some volume. In the aggregate value already mentioned are covered industrial buildings, hospitals and schoolhouses. Quality products have a good market—an evidence of the prosperity of the farmers—and one of the local concerns now reporting noteworthy improvement after a very dull winter is a maker of ornamental wire fences.

Meanwhile fabricators are waiting for structural work and one plant at least would probably be shut down had it not obtained contracts for building oil tanks for Oklahoma. Distributors of other lines of finished steel are also awaiting the tangible evidence of betterment, for while the specifications on contracts are good, they do not regard them as what they should be, considering the general conditions. W. W. M.

The Louisville Steel & Iron Company, Louisville, Ky., states that it will build furnaces for sheet mills and add other auxiliaries for the production of 600 tons of iron and steel sheets and corrugated roofing per month. A new steel building, 600 ft. in length, will be erected to provide for the manufacture of sheet bars and also a tandem rolling mill for the manufacture of bar iron.

Air Compressor Valve of Steel Strips

An automatic air compressor valve named the Laidlaw feather valve has been brought out by the International Steam Pump Company, 115 Broadway, New York. As will be noted from the illustrations,



Views of an Air Compressor Valve of Thin, Flexible Strips of Non-Corrosive Steel. The Top View Shows the Valve Parts in Section. Below, from Left to Right, Are Respectively: the Valve Seat; the Valve Strips Which Are Set to Cover the Openings in the Seat; and the Guard with Curved Slats that Allow a Maximum Flexing of the Valve at the Center of Each Strip. These Slats End in Recesses Which Maintain the Strips in Exact Position

the valve proper consists of thin, flexible strips of non-corrosive steel similar in appearance to ordinary clock spring stock. These valves are located between a valve seat with perfectly plain ground surface and a valve guard which is recessed to restrain the valve strips from lateral motion and retain them in their exact positions.

The valve strips are not rigidly held at any point, but are free to rise as the air presses against them, the strips flexing against the curved body of the valve guard. The ends of the valve remain in contact with the seat and are restrained from rising by the curvature of the guard. Each element or complete valve unit, therefore, consists only of three parts: a thin light rectangular metal strip valve, covering, when seated, a somewhat smaller slot in the valve seat; a plain ground face valve seat; and a valve guard with properly milled port openings and recesses for retaining the valve. The valve has no springs to break, no plates to crystallize, and no point of rigid connection with its seat.

Aside from its simplicity of design and complete freedom from springs, buffers and other parts, the manufacturer claims for the valve three special advantages. When the valve opens, the middle portion lifts while the ends remain in contact with the seat. It closes by increasing the point of contact, beginning at the ends and extending to the middle, doing away with all noise and destructive impact. It is further claimed that the contact closing of the valve

greatly reduces leakage as well as valve slip as the crank passes the center. The valve, in its normal operation, lifts sufficiently to give a normal opening through the double ported lift equal to the area of its seat, since the elimination of the closing impact through the contact seating makes possible a sufficiently high lift to give the equivalent area of the valve seat. It is claimed the valve is lighter than any other form of valve, and as a result the pressure required to open it is very slight.

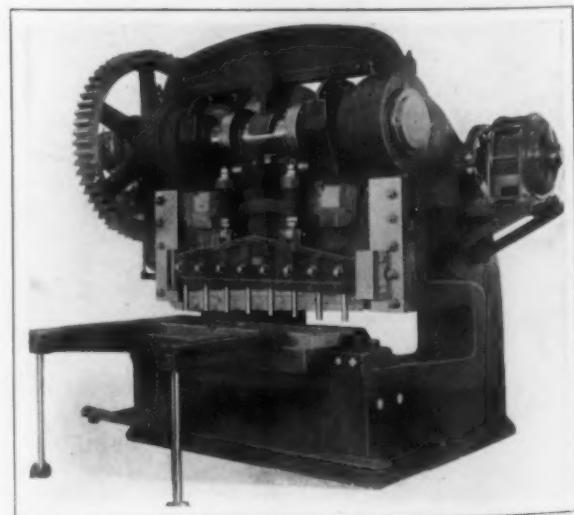
The valve strips are obtained from carefully selected coil valve stock. The expense of renewing them, should it become necessary, is obviously small. The arrangement of the valves in the cylinders permits complete interchangeability of any valve unit between suction and discharge, the valve unit, consisting of valve, seat and guard, being machined so as to be suitable for insertion on either suction or discharge, permitting one spare valve to answer for either function. This feather valve is being used by the Laidlaw-Dunn-Gordon plant of the International Steam Pump Company, in a new line of compressors recently placed on the market. It is used on steam as well as direct-connected motor-driven compressors.

A 72-In. Heavy Gate Shearing Machine

Bertsch & Co., Cambridge City, Ind., have recently designed a heavy shearing machine of the gate type. The machine, which has blades 72 in. long, will cut plates $1\frac{1}{4}$ in. in thickness up to the full width of the blades. A toggle joint clutch, upon which a patent has been applied for, forms a part of the equipment of the machine.

As will be noticed from the accompanying illustration, the machine is of heavy construction throughout, and all the gears, shafts and bearings are of large size, special attention having been given to the design of the parts to withstand the stresses and strains imposed by operation. The bed and two cross-tie pieces are relied upon to hold the various members rigidly in place. One of the cross ties is located in the rear of the gate, while the other is overhead, and both are bolted to the housings.

The machine has a new type of toggle joint clutch upon which a patent has been applied for. This clutch, it is pointed out, is positive, noiseless and automatic in action and operates on the toggle joint principle. The use of this construction tends to increase the engaging pressure against the clutch as it engages, which is relied upon to insure the



A New Heavy Gate Shearing Machine Capable of Cutting $1\frac{1}{4}$ -In. Plates 72 In. Wide

full contact of the jaws. A hardened steel roller acting against a cast-steel switch ring or sleeve, which can be renewed when necessary, serves to disengage the clutch.

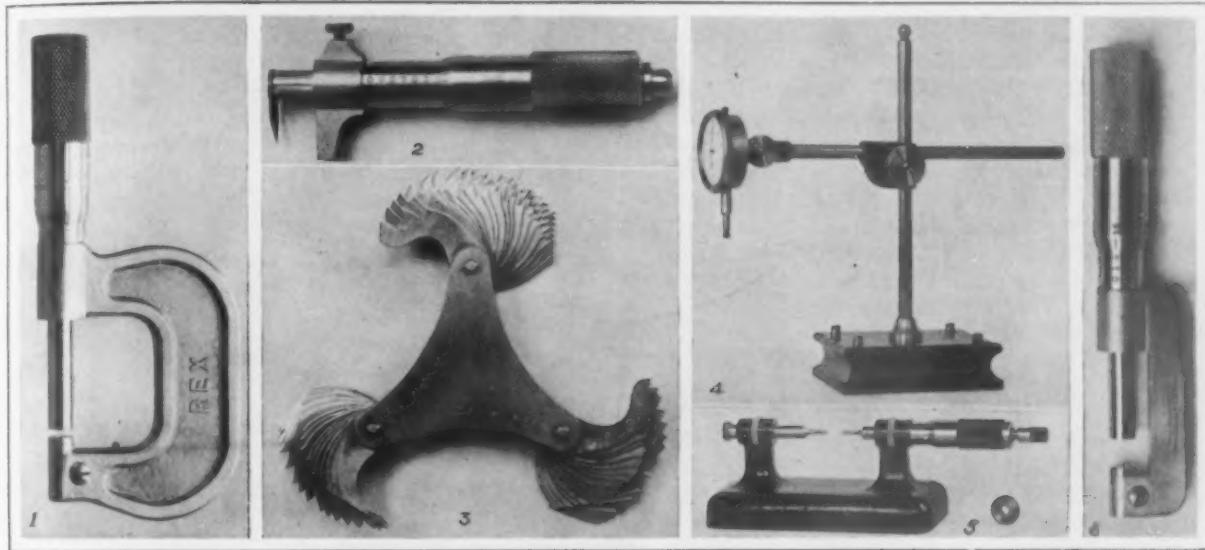
A Group of Machinists' Fine Tools

Several machinists' tools have been brought out recently by the Brown & Sharpe Mfg. Company, Providence, R. I. These include five different types of calipers for various purposes, a screw pitch gauge, a dial test indicator and a wire gauge.

The micrometer caliper shown at No. 1 of the accompanying illustration is made with a drop forged frame with a view to combining rigidity and strength with lightness and ease of handling.

is designed for measuring V threads of screws and nuts. The range is from 4 to 84 threads per in. It is pointed out that this large number of pitches, 51, is secured by the triangular form of the frame, which serves as a compact housing for the blades.

For the use of tool makers, inspectors and other machinists having frequent demand for a dial test indicator, that shown at No. 4 has been brought out. The base has been made large and heavy with a view to providing a firm support, while the design of the other members is relied upon to permit the indicator to be grasped firmly in the hand when moving it about. The four gauge pins placed at the corners can be pushed down when it is desired to use the indicator against a plate, straight edge, or side of a T-slot. The dial will read to 0.001 in. or



Some New Fine Tools That Have Been Developed for the Use of the Machinist. 1—A 1-In. Micrometer Caliper with Forged Frame. 2—Micrometer for Determining the Depth of Gear Teeth. 3—Screw Pitch Gauge for V Threads of Screws and Nuts. 4—Dial Test Indicator. 5—Bench Micrometer Caliper. 6—Hub Micrometer Caliper for Measuring the Hub Lengths of Cutters, Thickness of Saws, Etc.

An improvement claimed for it is the placing of the graduations corresponding to even multiples of 25 above the measuring line on the hub and below for the odd ones, thus facilitating reading at a glance. It has a dull nickel finish and all the bearing parts and measuring surfaces are hardened, means being provided to compensate for wear of the screw and anvil. The caliper as regularly furnished has a capacity of 1 in., but can be made for metric units with a range of from 0 to 25 mm.

For use where an ordinary type of micrometer caliper will not enter an instrument has been made with the end of the frame tapered. The thickness at the anvil is 11/32 in., but it is emphasized that the form of frame gives sufficient stiffness to resist any tendency toward springing which might make the tool inaccurate. A nut is provided to clamp the spindle and preserve the setting. This caliper has the same range as that shown at No. 1, and the graduations on the hub are arranged in the same way.

Other additions to the line of micrometer calipers are shown at Nos. 2, 5 and 6. The first of these is intended for measuring the depth of gear teeth, and its use is designed to do away with the necessity of using a large number of separate gauges. The second is a bench micrometer caliper with a heavy base for tool makers, jewelers, etc., having a capacity of 1 in. The third caliper is known as a hub caliper and is intended for measuring the exact hub length of cutters for various machine tools, thickness of saws, etc.

The improved screw pitch gauge shown at No. 3

0.01 mm., and is adjustable to enable the zero to be set in any desired position.

Another of the tools which is not illustrated is a steel music wire gauge. This is of the ordinary round type and has a range from Nos. 000000 to 33, American Steel & Wire Company's new standard. Decimal equivalents of the numbers are stamped on the reverse of the gauge.

Continuous Pair Heating Furnace

T. V. Allis of the George J. Hagan Company, Pittsburgh, has patented a continuous pair heating furnace for sheet and tin mills, which is being installed by this company. The bars are fed into the rear of the furnace and advance automatically to the discharge end. There are no moving parts in the interior of the furnace and scaling of bars is avoided. The furnace is equipped with underfeed stokers. Air supply is gauged by coal consumption. The pairs are heated in such a manner that each bar passes through the same heat zones, and as the temperature is kept at that desired for rolling, no piling of bars is necessary. The heater simply drags the bars from the furnace discharge to the rolls. Installations of these furnaces have been made by the American Rolling Mill Company, Middletown, Ohio, and the American Sheet & Tin Plate Company at Wellsville, Ohio, and Monessen, Pa.

The Universal Iron & Supply Company, 325 Locust street, St. Louis, Mo., is distributing a circular containing a calibration curve for horizontal cylindrical tanks of any dimensions. The ordinates of the curve are depth and capacity arranged on a percentage basis, and it is designed to give the capacity of a tank for any depth of water.

Graphic Method of Estimating Core Costs

An Ingenious Chart by Means of
Which the Cost of a Mixture Can Be
Found for Varying Ratios and Values

BY EDWARD S. DEAN

Few foundry subjects can be discussed to greater advantage than core mixtures, yet they are disregarded rather more by foundrymen than any one factor in foundry operations. To many, a core has served its purpose when it has assisted in making a casting, a lug hub or part of a mold, the core having had little or no other consideration. It is not my intention to take up the many kinds of core oil mixes, but to offer a method of ascertaining at a glance the cost of core mixtures, believing this will lead to the practice of economy.

With the fluctuation in the cost of core coils, the cost of core sand and the changing of the ratio of oil mixed per gallon of sand, it is not an easy matter to keep in touch with the cost of the completed core mixture of sand and oil, and more especially when batches of different strength are mixed each day. Few have sufficient extra time to devote to the necessary calculations. For instance: Using a purchased core oil compound costing 29c. per gal., mixing one part with 42 parts of sand (at \$1.25 per ton) for part of the work and for another part of the work straight linseed oil (at 60c. per gal.) one part, sand 90 parts, at \$1.25 per ton, a glance at the chart will show the cost of the final mixture in both cases to be practically the same, \$0.0145 and \$0.0147, or about 1½c. per gal.

I have devised the combined alignment and rectangular chart, shown in the illustration to give to the manufacturer, core-maker, foundryman or cost clerk, at a glance, the cost per gallon of sand and core oil mixed, even though the ratio of sand and oil mixed, the price per gallon of oil and price per ton of sand may all vary constantly. No mathematical calculations are necessary. All that is required is a thread or fine wire, or a straightedge, shown by the dotted line, to be used in conjunction with the chart; a little explanation will be sufficient.

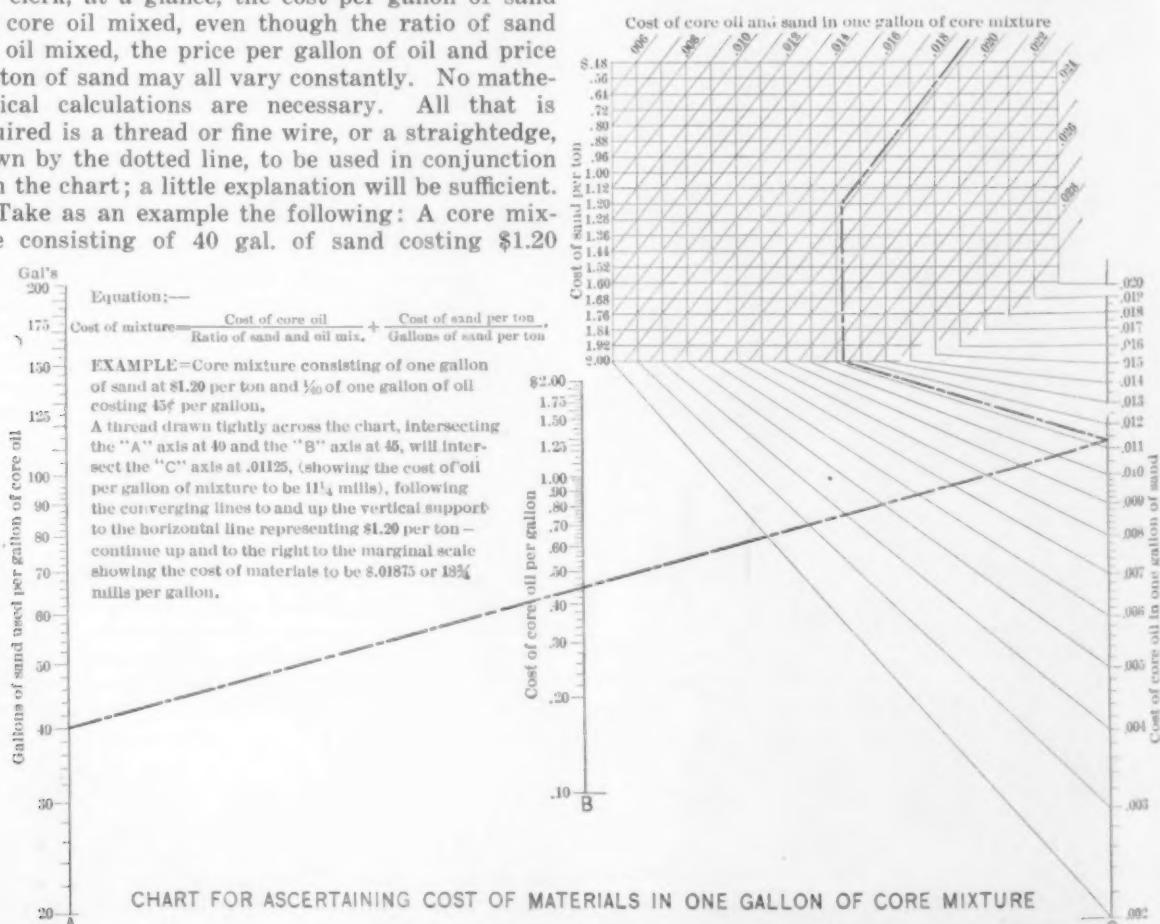
Take as an example the following: A core mixture consisting of 40 gal. of sand costing \$1.20

per ton and 1 gal. of core oil costing 45c. per gal. The graphic solution is: Draw a thread lightly (or use a straightedge) across the chart intersecting the A axis at 40, representing the gallons of sand and intersecting the B axis at 45, representing the cost per gallon of oil, and it will be seen that the thread intersects the C axis at 0.011¼, which is 11¼ mills, or the cost of core oil in 1 gal. of sand. Following the converging lines to the rectangular chart and thence vertically intersecting the horizontal lines representing the cost of sand per ton \$1.20, continue along the diagonal line up and to the right to the top line where you find 0.018¾ or 18¾ mills, which is the cost of 1 gal. of core mix, consisting of 1 gal. of sand at \$1.20 per ton and 1/40 of 1 gal. of core oil, costing 45c. per gal.

Mixing 60 parts of sand, costing 80c. per ton, with 1 gal. of core oil at 36c. per gal., we find 1 gal. of mixture costs 12 mills and that the cost of oil per gallon of mixture is 0.006, or 6/10 of one mill.

In trying out samples of new core oil compounds (numerous samples of which are furnished us by our supply houses), you ascertain the necessary ratio of sand and oil by tests. Then a glance at the graphic chart tells you whether or not the oil is attractive from a cost point of view.

A little familiarity will make the chart indispensable, and continued use will surprise even those experienced in efficiency practice.



Economy in Insurance Methods of Employers

Experience with the Plan of the Ferro Machine & Foundry Company, Which Carries Its Own Insurance in Preference to Dealing with the State

Whether it is more economical for a manufacturing company to carry its own insurance or to contribute to the State insurance fund, in States having compulsory workmen's compensation laws but allowing the alternative of direct payments to the injured or indirect payment through the State, is one that is attracting a great deal of attention among manufacturers. Ohio is one of the States having a compulsory workmen's compensation law but employers who come under the law are allowed to carry their own insurance direct or through liability companies. In that case payments to injured employees and to beneficiaries of those fatally hurt must equal in amount the sums allowed by the State for similar injuries, and the employer must pay into the State fund 5 per cent. of the amount he would be required to pay were he allowing the State to carry his insurance. The small employer who carries his own insurance has the additional expense of paying the premium on a bond required by the State to assure the payment of compensation to employees.

The last official reports of the Industrial Commission of Ohio, that has charge of the administration of the workmen's compensation law, show that near the end of 1914 there were 15,935 employers who were paying the State premiums and allowing the State to carry their insurance, and that 785 employers were carrying their own insurance. But those who carry their own insurance include a large number of the largest employers of labor in the State, many of these being steel plants and other plants in metal working lines. During the first three months of 1915, 56 Ohio employers withdrew their insurance from the State and began carrying their own insurance either direct or through liability companies. During the same time 82 that were either carrying their own insurance or had liability policies, changed over to State insurance.

REDUCTION OF LOSSES DUE TO ACCIDENTS

The Ferro Machine & Foundry Company, Cleveland, is one of the large employers of labor that is carrying its own industrial insurance and this company is giving a great deal of attention, not only to reducing the number of accidents, and to accident prevention methods, including the installation of safety devices, but it has applied efficient methods to the care of injured employees in order to reduce to a minimum the time lost due to accidents. It has thus not only reduced the cost of compensation but the loss to the employers that results from having skilled men kept away because of injuries.

Before it decided to carry its own insurance the company took up the matter of workmen's compensation with a liability company and was quoted an insurance rate of \$1.80 per \$100 of pay roll. The State named a rate of 92c. but later it found that it had placed the company in the wrong class and reduced its rate to 70c. On deciding to carry its own insurance a social service department was created which, in addition to other duties, has charge of the care of injured employees and the payment of compensation. Attention was turned to the hospital dispensary, which, although well

equipped, was found to be lacking in efficiency, largely because of incompetent nurses. In this connection it should be said the laws of the State are considered lax in regard to the qualification of nurses and as a result many graduate nurses, it is alleged, lack the necessary training. Workmen slightly hurt frequently did not go to the dispensary for treatment, either not having slight injuries attended to until in some cases these caused serious results, or going to a physician of their own nationality in the neighborhood, some of whom were incompetent. A competent nurse was placed in the dispensary and the physician formerly employed by the company was replaced by one who was regarded as better qualified.

AN INTERPRETER IN THE DISPENSARY

An innovation that the company regards of unusual importance, is the placing of an interpreter in the dispensary. A bright young man, who had been employed in another department and who had a large acquaintance among the employees, was selected for this work and is constantly on hand. Through the interpreter the physician and nurse are able to get a clear understanding of a case that would often be impossible, were the injured man unable to speak English. The physician is on duty at the plant 1½ hours every morning and makes calls at their homes on employees injured in the plant. In some special cases he is sent to look up men who have been away from work for several days. Some of these are found to be seriously ill and without, or with incompetent, medical attendance.

Through the plant 14 bulletin boards are maintained on which are posted printed safety-first lessons, including many drawn from accidents in the plant. For example, a workman jumped from a ladder and stepped on a sprue, which entered his foot, causing a bad wound. On a poster was displayed a reproduction of the photographs of the sprue and of the injured man and a story of what the accident cost the man and the company. When men in the shops look sick or tired they are sent to the dispensary. Twenty-seven per cent. of the total number of employees visited the dispensary for medical attendance in February and 29 per cent. in March.

ROTATION IN DANGEROUS WORK

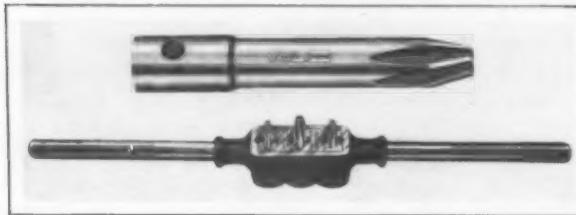
The department is handled as if occupational disease laws were in effect. Rotation of dangerous work is required. For example men are not kept on sand-blast work for over three months at a time. One important advantage found by the company in carrying its own insurance is the co-operation of the foremen. With the State paying compensation claims few foremen apparently appreciated that the cost comes out of the company indirectly, but with the company paying these claims direct, foremen show greater interest in keeping down the number of injuries and compensation claims. The department is conducted entirely independent of other departments and its aim is to make it pay its own way. Even a special form of checks is used in settling compensation claims.

The company has been carrying its own accident insurance under its present system of efficiency in attending to accident cases since last July, and during that time it has made a remarkable saving in the cost of maintenance of the department and payment for injuries as compared with the cost of liability or State insurance. While results are so far wholly satisfactory, the company realizes that the actual figure of the amount saved, as compared with the cost of State or liability insurance will be more conclusive after the system has been in effect a much longer time, for the reason that, should a number of serious accidents occur within a limited period, the amount saved in nine months might be nearly wiped out.

That more efficient methods in the dispensary are bearing fruit is shown by the fact that there has been a reduction in the time loss per case of record. Time loss per case of record last July was 1.09 days. In November it was brought down to 0.40 of a day and the last report shows 0.76 of a day per case, this increase being attributed to the fact that work in the plant has been speeded up considerably. Cases of record include all cases that the law requires to be reported to the State Industrial Commission.

Pipe Threading Tool Internal Guide

An internal guide for pipe threading tools having a reamer point has been placed on the market by the Greenfield Tap & Die Corporation, Greenfield, Mass. It is designed to take the place of the various



An Internal Guide for Pipe Threading Tools Which Is Designed To Remove the Burr from the End of the Pipe and Start the Die Straight, and Below the Guide Applied to a Three-Die Stock

forms of external or bushing guides which have been in general use up to this time for guiding the dies in pipe stocks when straight threads were to be cut. In addition the reamer point is intended to remove all burrs on entering the pipe and cause the die to start straight. In this way two operations are performed at once, with a saving in the cost of the burring reamer, besides the time and cost of one operation. This advantage, it is emphasized, is also secured when pipe is cut on an angle, the die being kept from tipping and making a crooked start by the guide. The reamer guide working inside the pipe, it is pointed out, permits threads to be cut on a shorter projection than was possible with the old type of bushing guide.

The guide is fitted to all the maker's forms of pipe stocks, one of which, the Trio, is illustrated. This stock contains three standard sizes of dies as well as the guides and is intended to take the place of seven different tools that would otherwise have to be employed, three stocks and dies, three burring reamers and one tap and reamer wrench. This arrangement eliminates the extra weight of several stocks, and the knurled handles, which are made of light steel tubing, can be removed and packed with the workman's kit. The Duo pipe stock, which contains two cutting dies, is equipped with this guide,

as are also the pipe threading sets for ceiling work, the ratchet pipe stock and stocks and dies for threading thin metal tubing. With this last, internal guides are provided for each cutting size and are relied upon to support the tubing and prevent it being crushed or distorted in addition to insuring a straight start. For accommodating different thicknesses of tubing, guides of various diameters are furnished. With these dies, it is possible to thread nickel plated or other highly polished pipe without marring the surface, an objection that sometimes was present with the external guide.

OHIO FOUNDRY CONFERENCE

Ohio Industrial Commission Meets Foundrymen and Molders' Union Representatives

The questions of safety and sanitation were discussed in an all-day session of the Industrial Commission of Ohio, jointly held with foundry operators and representatives of the Molders' Union, at the Hotel Gibson, Cincinnati, April 30. At an informal meeting of the different committee members, held prior to the business session, it was suggested that the rules and regulations recently adopted by the Industrial Board of the New York State Department of Labor be discussed with a view of adopting them in Ohio.

Victor T. Noonan, director of safety for the commission, opened the meeting with an interesting address, in which he said that there were approximately 80,000 accidents in Ohio each six months. He called particular attention to the fact that the employer was too often unjustly blamed for accidents that happened in his plant. However, he stated that many manufacturers overlooked the question of educating their employees, and that many of them considered their responsibility ended when safety devices were provided for all machines. That the workman should be taught in a tactful way to take care of himself is a matter of great importance. Mr. Noonan also referred to the large number of accidents that could be traced to overindulgence in alcoholic stimulants, and intimated that moral suasion might be a more effective remedy than drastic legislation.

Thomas J. Duffy, a member of the Ohio Industrial Commission, urged those present to be very careful in making recommendations, as he stated that the regulations that would finally be recommended by the commission would be enforced. In fact, the regulations of the commission would automatically become laws, and for this reason he hoped that both the employer and the employee would co-operate with the commission.

Addresses were made by Henry Ritter, general superintendent of the Lunkemheimer Company; J. D. Leary, president Leary & Manley Foundry Company; J. A. Oberhelmann, president Oberhelmann Foundry Company, and Walter Geier, general manager of the Modern Foundry Company, all of Cincinnati. These speakers all stated that the foundry owners were more than willing to co-operate with the Ohio Industrial Commission on matters of safety and sanitation, but they believed no hasty action should be taken in adopting regulations along these lines. J. J. Bever, general manager of the Otis Steel Company, Cleveland, in commenting on the New York regulations, stated that the steel foundries should be consulted before the commission ultimately decided on its recommendations. He called attention to a number of proposed rules that would work a hardship on large steel foundries, and at the same time would not result in any benefit to the workmen.

The following are the committees appointed on safety and sanitation:

Executive Committee

Employers—Thomas D. West, West Steel Casting Company, Cleveland, chairman; J. F. Sords, Allyne-Ryan Foundry Company, Cleveland.

Labor—Fred L. Baumgartner, secretary International Molders' Union, Cleveland, secretary; Peter Curley, 714 Marion Building, Cleveland.

Subcommittee for Gray Iron

Employers—H. J. Boggis, Taylor & Boggis Company, Cleveland, chairman; J. D. Leary, Leary & Manley Company, Cincinnati.
Labor—Fred L. Baumgartner and Peter Curley.

Subcommittee for Steel

Employers—J. J. Bever, manager, Otis Steel Company, Cleveland, chairman; J. E. Galvin, vice-president, Ohio Steel Casting Company, Lima.
Labor—Fred L. Baumgartner and Peter Curley.

Subcommittee on Malleable

Employers—H. G. Thompson, Columbus Malleable Iron Works, Columbus.
Labor—Frank J. O'Brien and Peter Curley.

Subcommittee on Brass and Aluminum

Employers—Thomas McDonald, Platt Iron Works, Dayton.
Labor—Peter Curley and Frank J. O'Brien.

It was decided to hold the next joint meeting at Springfield, May 21. In the meantime, Chairman Thomas D. West has arranged to send a notice to every foundry owner in Ohio, inclosing a copy of the tentative rules to be adopted.

Mr. West's committee presented 98 rules for the consideration of the subcommittees and foundrymen attending the sessions. A number of these rules were taken from those which had been compiled for the Industrial Board of New York by its foundrymen appointed to do this work. A few of the New York rules were amended at Cincinnati to embody features found in the Ohio committee's proposal and to also make them better adaptable to general conditions. The Ohio rules which had reference to the construction of foundries and the operation of cranes were set aside to be handed over to the committees who are to compile rules for governing construction work and for the operation of power and machinery in Ohio, with the request that all the original features found in the Ohio foundrymen's proposals on these points be embodied as far as practicable in the other committees' rulings.

A number of the safety proposals embodied in the above 98 rules, on account of their advisory nature, were not adopted to become laws, but were recommended for the consideration of the commissioners, with the solicitation that they should be printed and accompany the laws as advisory measures to govern foundrymen in complying with the Industrial Commission's aims to attain the highest efficiency in all that pertains to safeguarding foundry employees.

Chairman Thomas D. West, in an interview after the business session, stated that he was much pleased with the interest taken by both employers and employees in the questions of accident prevention and sanitation, which are of so much importance to foundrymen. He also said that as soon as the foundry operators ascertained how much it was to their interest to co-operate with the State Industrial Commission these meetings would be more largely attended. He further called attention to the comparatively late change of attitude between employers and employees and the willingness on the part of both to co-operate in carrying out measures that are intended for their mutual benefit. Up to a few years ago quite a number of foundries were only equipped with a bucket for the use of workmen in washing up after the day's work, while now a large number of foundries have installed shower baths and the latest kind of sanitary plumbing fixtures for the use of their men. While in many instances the men have appeared unappreciative of these changes, in Mr. West's opinion this was due, in a measure, to the lack of tactful education by the employer.

As far as the matter of installing safety devices is concerned, Mr. West's idea is that the modern foundryman is always eager for suggestions along this line. It is an economic question that cannot be overlooked by the progressive manufacturer, and he stated that he had known of instances where suggestions of the Industrial Commission were not only followed out to the letter but more stringent rules for safety were voluntarily adopted by these employers.

The Sullivan Machinery Company's branch office at Denver has been changed from 1748 Broadway to 837 Equitable Building. George W. Blackinton is manager.

HEAD OF LA BELLE IRON WORKS

R. C. Kirk Has Been Chosen President to Succeed
W. D. Crawford

At a meeting of the board of directors of the LaBelle Iron Works, Steubenville, Ohio, last week, W. D. Crawford, who has been president of the company for two years, tendered his resignation, making it effective May 1. It is stated that there has been some friction among the directors and large stockholders over certain policies of the company and in order to secure harmony President Crawford decided to retire. For more than a year



R. C. KIRK

he has desired to be relieved of the position and he intends to take a long rest. Prior to becoming president Mr. Crawford was vice-president and general manager of the LaBelle Iron Works and he will continue as a director.

R. C. Kirk, who has been secretary and treasurer of the company, has been elected to succeed Mr. Crawford as president. Mr. Kirk was born in 1877 at Ellsworth, Mahoning County, Ohio. He attended the district school there, later going to the high school at Warren, and Northwestern Ohio Normal College at Canfield, Ohio. Upon graduating from the latter, he taught school for one year and then entered the employ of the Falcon Iron & Nail Company and the Falcon Tin Plate & Sheet Company at Niles, Ohio, in 1895. In 1900, when the plant of the Falcon Iron & Nail Company was sold to the American Sheet Steel Company, he entered the employ of the latter concern in New York in the auditing department, leaving this position in December, 1903, to become auditor of the LaBelle Iron Works. He was elected treasurer of the company on July 1, 1904, and on February 1, 1913, was made secretary, having very capably filled both positions since. The offices of secretary and treasurer will be filled in a short time.

Refined Antimony From Mexico

The first smelter in Mexico to produce refined antimony for the market will be ready to start at San Luis Potosi when mining and transportation conditions permit. The machinery is all American and American capital owns the company. The capacity will be 3000 tons of refined star antimony per year, all to be shipped to the United States, and the ore is to come from the company's own properties in San Luis Potosi and Queretaro. The only other antimony smelter in Mexico is at Wadley, which exports its product to England for refining.

TESTING SOCIETY'S PROGRAMME

Eighteenth Meeting at Atlantic City June 22-26
—New Officers

The 18th annual meeting of the American Society for Testing Materials will be held at the Hotel Traymore, Atlantic City, N. J., June 22-26, beginning Tuesday and ending Saturday. The secretary, Prof. Edgar Marburg, has sent out the provisional programme for the meeting. Below are given the papers and reports scheduled for sessions which are of direct interest to *The Iron Age's* readers. In addition, the session of Thursday afternoon, June 24, will be devoted to cement and concrete; that of Friday morning, June 25, to ceramics, gypsum and lime, and that of Saturday morning, June 26, to road materials, timber and rubber:

First Session, Tuesday, June 22, 11 a.m.

Minutes of the seventeenth annual meeting.

Annual report of executive committee.

Report of Committee D-5: On Standard Specifications for Coal. J. A. Holmes, chairman.

Report of Committee D-6: On Standard Specifications for Coke. J. A. Holmes, chairman.

The Fusibility of Coal Ash. A. C. Fieldner, A. E. Hall and A. L. Feld.

Report of Committee E-5: On Technical Committees. Edgar Marburg, chairman.

Report of Committee E-6: On Papers and Publications. Edgar Marburg, chairman.

Election of officers.

Miscellaneous business.

Second Session, Tuesday, June 22, 3 p.m.

Report of Committee A-2: On Standard Specifications for Wrought Iron. S. V. Hunnings, chairman.

Report of Committee A-3: On Standard Specifications for Cast Iron and Finished Castings. Richard Moldenke, chairman.

Report of Committee A-5: On Corrosion of Iron and Steel. S. S. Voorhees, chairman.

Report of Committee D-9: On Standard Tests of Insulating Materials. C. E. Skinner, chairman.

Third Session, Tuesday, June 22, 8 p.m.—On Non-Ferrous Metals.

Annual address by the President.

Report of Committee B-1: On Standard Specifications for Copper Wire. J. A. Capp, chairman.

Fatigue of Copper Alloys. Ernst Jonson.

Molten Zinc as a Reagent for Etching in the Macroscopic Examination of Steel. Jesse L. Jones.

Battery Zincs—Some Causes of Defective Service. Robert Job and F. F. White.

The Determination of Spelter Coating on Sheets and Wire. J. A. Aupperle.

Fourth Session, Wednesday, June 23, 10 a.m.—On Steel.

Report of Committee A-1: On Standard Specifications for Steel. C. D. Young, chairman.

Report of Committee A-8: On Standard Specifications for Cold-Drawn Steel. C. E. Skinner, chairman.

Report of Committee E-1: On Standard Methods of Testing. G. Lanza, chairman.

Elastic Limit: T. D. Lynch.

The Elastic Limit of Steel Determined by Transverse Test, and its Relation to the Tensile Elastic Limit. W. K. Shepard.

Fifth Session, Wednesday, June 23, 8 p.m.—On Heat Treatment of Steel.

Micrographic Determination of Surface Decarburization in Heat-Treated Steels. J. G. Ayers, Jr.

The Relations Among Maximum Strength, Brinell Hardness and Scleroscope Hardness in Treated and Untreated Alloy and Plain Steels. R. R. Abbott.

Some Neglected Phenomena in the Heat Treatment of Steel. M. E. Leeds.

The Charpy Impact Test on Heat-Treated Steel. J. J. Thomas.

Some Reasons why the Use of Heat-Treated Material has been Subject to Criticism. H. V. Wille.

Comparison of Physical Properties Obtained from Carbon Forging Steel when Water and Oil Quenched. C. D. Young.

Sixth Session, Thursday, June 24, 10 a.m.—On Testing Apparatus.

The New Physical and Chemical Laboratory of the Pennsylvania Railroad Company at Altoona. C. D. Young.

The Failure of Materials Under Repeated Stress. H. F. Moore and F. B. Seely.

A Laboratory Method of Determining Pressure on Walls and Bins. J. Hammond Smith.

A Universal Strainometer of Simple Design. S. H. Graf.

Ninth Session, Friday, June 25, 3 p.m.—On Preservative Coatings and Lubricants.

Report of Committee D-1: On Preservative coatings for Structural Materials. P. H. Walker, chairman.

Report of Committee D-2: On Standard Tests for Lubricants. C. P. VanGundy, chairman.

A Cylinder Friction and Lubrication Testing Apparatus. A. E. Flowers.

Wednesday afternoon and Friday afternoon are

recreation periods and Thursday evening has been reserved for a smoker.

The Committee on Nominations has presented the following ticket:

For president, Mansfield Merriman.

For vice-president, Wm. H. Bixby.

For members of executive committee, James H. Giboney, Wm. K. Hatt, John A. Mathews, and Edward Orton, Jr.

Ernst Reitler, general secretary of the International Association for Testing Materials, announces under date of March 15 that the war has interrupted the association's activities, and for months his office has confined itself to bringing the work of the sixth congress (New York, 1912) to a conclusion by issuing a reprint of the uniform nomenclatures recommended by that congress. In the interruption of the work of the association the members will not be called upon for payment of dues.

A Bearing Metal of High Elastic Limit

An alloy containing about 97 per cent. lead, hardened without antimony, copper or spelter, has been brought out by the Lubricating Metal Company, New York, for use in general bearing work. Under a compression test of 13,000 lb. a cylinder 1 in. in diameter and 1 in. long showed a permanent set of 0.0086 in. As a result of this and similar tests, an elastic limit of about 11,000 lb. per sq. in. is claimed, or nearly twice that of genuine babbitt, which is around 6500 lb. per sq. in. It has an ultimate strength in compression of approximately 22,000 lb. per sq. in. Tensile tests indicate an ultimate strength of from 13,000 to 15,000 lb. per sq. in. As the composition is varied to raise the elastic limit, it is asserted that the effect is to lower the ultimate strength. This is exactly opposite to the results obtained in other classes of metals. The alloy is known as noheat.

It is claimed that it retains all the natural lubricating qualities of lead and has a coefficient of friction about 25 per cent. less than that of other bearing metals. In the process of manufacture the hardening agent impregnates the metal with an alkaline substance, so that wherever it is used in pumps, water-jacketed bearings or elsewhere coming in contact with water, a slight saponification is produced which further aids lubrication and reduces friction. The high tensile and compressive strength of the alloy, together with its low coefficient of friction, are given as reasons why it is adapted to use on high-speed machinery as well as heavy duty work. This is said to be one of its greatest advantages, in that it eliminates the practice of having a different metal for each grade of work.

The melting point of the alloy is 589 deg. F., about 120 deg. F. higher than that of tin base metals. Good practice, however, indicates that it should be poured nearer its melting point than other bearing metal mixtures are. The pouring should be rapid, and whenever hammering is done it should be while the metal is hot.

When putting this metal into general mill work, it is usually advisable to discontinue the practice which has hitherto prevailed of putting in brass strips along with babbitt. The great resistance noheat has to compression gives it sufficient strength to stand the heaviest service without the additional brass strips. It is claimed the elimination of the brass strips reduces the frictional load and the tendency of the bearings to heat; and at the same time the scoring of the shafting which so often occurs when brass is used is said to be entirely stopped. The manufacturers recommend that when the shafting is in fair shape and not fire cracked these brass strips be eliminated in all classes of pinion bearings, horizontal rolls for blooming mills and the greater portion of roll work for the mills. A further advantage is claimed for the metal that in positions where scale is likely to fall or accumulate in the bearings, the usual wear on the shafting is done away with. This is stated to be particularly noticeable in installations in the roughing stands of mills, horizontal rolls of blooming mills and in roll tables.

ELECTRIC ANNEALING FURNACES

Advantages for Reheating and Heat Treating
Over Combustion Types—Cost Data

"In the 25 years that have passed since the early and crude development of electric melting and refining furnaces, there have been put into service more than 100 of these furnaces, ranging in commercial capacity from one to 20 tons, and in electrical capacity from 100 to 3000 kilowatts. Central stations that 25 years ago considered 10c. per kw. hr. a low rate are now, with the modern equipments of power generation, furnishing electric furnaces with current for less than $\frac{3}{4}$ c. per kw. hr." This summary of the advance in the use of the electric furnace for melting and refining, was given by T. F. Bailey, president of the Electric Furnace Company of America, Alliance, Ohio, in a recent paper before the Engineers' Society of Western Pennsylvania on "The Electric Furnace for Reheating, Heat Treating and Annealing." In discussing reheating furnaces with granular resistors, Mr. Bailey said:

The type of furnace that seems best adapted for reheating operations is the resistance type in which the material to be heated is entirely separate from and independent of the resistance elements in which the heat is generated by the electric current. This arrangement makes for the maximum simplicity and convenience in operation. A general description of this type of furnace is as follows:

Through the side walls of a furnace shell made of suitable refractories are inserted two carbon or graphite electrodes. The inner ends of these electrodes extend into a trough of highly refractory material. This trough is filled with the resistance material itself, usually some form of broken carbon, and makes contact at each end with the electrodes. The outside ends of the electrodes are connected by means of suitable copper terminals and cables to the regulating transformer and switch by means of which the voltage impressed across the furnace is regulated, the voltage thrown on the furnace having a definite relation to the current flow and heat input. The material to be heated is placed conveniently adjacent, at the side or above or underneath the resistance material and its containers as the case may be. In some heating operations the actual cost of heating per ton is less with electric furnaces than with combustion furnaces, while in some heat-treating and annealing operations the precision with which the operations are carried on must be the justification for the higher cost of heating in the electric furnace.

ELECTRIC AND COMBUSTION FURNACES COMPARED

The principal advantage of electric furnaces over combustion furnaces for reheating are more accurate temperature control, non-oxidizing atmosphere, saving in space, elimination of blast or stack, evenness of temperature throughout the heating space, simplicity of control, small amount of heat lost to the surrounding atmosphere, and cleanliness of surroundings. Electric furnaces of the character described may be controlled with great precision for the reason that a given input of electric current liberates a given quantity of heat units within the furnace, the transfer of electric current to heat being at 100 per cent. efficiency.

The space required for electric furnaces is considerably smaller than that required by combustion furnaces, due to the fact that no stack nor combustion chamber is required, and the electric cables carrying current to the furnace require much less space and are far safer than gas or oil lines and much more readily located.

For furnaces in capacities of one ton per hour and above, the continuous type of billet heating furnace offers some advantage in economy as well as in mechanical operation, as in the continuous type only the discharge end of the furnaces reaches the full ruling temperature, the lower temperature of the feeding reducing the wall loss of the furnace very materially. The fol-

lowing calculation of a heat balance sheet may be taken as typical for this type of continuous billet heating furnaces heating material to 2000 deg.:

Capacity, 10 tons per hour.
Temperature, 2000 deg.
Wall loss in k.w. hr., 250.
Theoretical heat required per hour by metal in k.w., 2150.
Kilowatt hours per ton of metal heated, 240.
Cost of heating per ton with current at $\frac{1}{2}$ cent per k.w., \$1.20.

This figure of cost per ton of metal heated becomes prohibitive unless account is taken of the metal loss due to the oxidizing influence of the flame in gas-fired billet heating furnaces. Even making allowances of 2 per cent. on \$20 steel, this type of furnace seems to have no prospect of competition for large tonnages unless the cost of electric current is under the rate named in the above tabulation. In heating higher grades of steel, especially steel of crucible quality, the saving in scale over any combustion furnace practice will far outweigh the higher cost of heating by the electric furnace.

It may be stated that the small electric reheating furnaces are commercially feasible from a fuel standpoint alone, where the current consumption per ton is 400 k.w. hr. and the rate 1c. per k.w. hr., compared with oil where the consumption per ton is 100 gal. at a cost of 4c. per gal., or natural gas where the consumption per ton is 12,000 cu. ft. at 33c. per 1000 cu. ft. With an allowance made for the saving of metal due to absence of scaling in the electric furnace the saving in heating cost per ton on the above will be that percentage of saving multiplied by the cost of steel per ton; as, for instance, 5 per cent. saving on an automobile steel worth \$50 per ton, or net saving of \$2.50 per ton of metal heated. On this basis the metal saving and with a consumption of 100 gal. of fuel oil per ton in order to compete with electricity at 1c. oil would have to cost not to exceed 1 $\frac{1}{2}$ c. per gal., or with oil at 3c. the fuel consumption would have to be under 50 gal. per ton.

High Prices for Iron and Steel in Germany

Prices of pig iron and steel in Germany fell to rock bottom just previous to the war. The decided advance which war conditions have produced is shown by the following table giving prices prevailing in the quarter just previous to the war and those now quoted:

	Second quarter, 1914	Second quarter, 1915
No. 1 foundry iron	\$18.12	\$21.05
No. 3 foundry iron	16.91	19.83
Hemタイト iron	19.34	24.33
Ingots	20.08	23.72
Blooms	21.29	24.94
Billets	23.12	26.76
Sheet bars	23.72	27.37
Basic steel bars	21.90	30.42
Basic plates	23.36	31.02
Basic wire rods	28.59	\$29.20 to 30.42

The quotations for iron are based on Oberhausen; those for semi-finished and finished steel are the Steel Works Union's.

Not British Ship Plates That Failed

The title of an article in *The Iron Age* of March 18, 1915, "Failure of British Steel Ship Plates," was erroneous, since the plates in question, which were discussed in a paper before the Northeast Coast Institution of Engineers and Shipbuilders (British) were of continental and not British manufacture.

John J. Caine, iron and steel merchant, whose main offices are in the North American Building, Broad and Sansom streets, Philadelphia, has removed his branch office in New York City from 140 Liberty street to 90 West street, room 1120. V. Horton is the New York representative.

The Twentieth Century Heating & Ventilating Company, Akron, Ohio, manufacturer of house-heating furnaces, announces that it will place a profit-sharing system in effect July 1. About 175 employees will be benefited.

Judicial Decisions

BY A. L. H. STREET

COLOR AS A TRADEMARK.—Coloring a strand of wire rope cannot be the basis of a valid trademark, unless the claimant adopts a distinctive color. A trademark calling for "a helical stripe or band of uniform width and distinctive color, this color being usually red and produced by painting one of the strands of the rope," is, therefore, invalid as failing to adopt a distinctive color. If red is adopted in such a case, use of a yellow stripe by a competitor cannot be deemed to infringe the trademark. (United States Circuit Court of Appeals, Eighth Circuit, A. Leschen & Sons Rope Company vs. Fuller, 218 Federal Reporter 786.)

DUTY TO SAFEGUARD TRESPASSING CHILDREN.—A company which maintains a machine shop near a street, with doors open in such manner that children may naturally be expected to come upon the premises, is under legal obligation to so guard the premises that children will not be injured. (United States Circuit Court of Appeals, Third Circuit, Chesko vs. Delaware & Hudson Company, 218 Federal Reporter 804.)

LIABILITY FOR FREIGHT ON INFERIOR GOODS.—When a buyer of goods rejects them at the destination as being inferior to the quality contracted for, he is entitled to recover freight charges paid thereon and cost of handling. (Maine Supreme Judicial Court, Keeling-Easter Company vs. R. B. Dunning & Co., 92 Atlantic Reporter 929.)

RUPTURE AS COMPENSABLE INJURY.—Injury to, or death of, an employee at a machine shop, resulting from rupture sustained in carrying a heavy object in the course of his employment, is subject to award under the West Virginia workmen's compensation act. (West Virginia Supreme Court of Appeals, Poccardi vs. Public Service Commission, 84 Southeastern Reporter 242.)

WHEN FACTORY ACT VIOLATION IS NOT ACTIONABLE.—An employee cannot recover for injury sustained, on the theory of negligence on the part of his employer in failing to comply with the West Virginia law which requires machinery to be safely guarded when possible, or if not possible that notice be posted, etc., unless it is established by such employee that his work required him to be near the machine where the accident occurred while it was in motion; and that it was possible to have guarded the parts of the machine which caused the injury; or that no notices were posted as required by the law. (West Virginia Supreme Court of Appeals, Gallik vs. Wheeling Steel & Iron Company, 84 Southeastern Reporter 253.)

DUTY TO SAFEGUARD MACHINERY.—Under the Iowa factory act, which requires dangerous machinery to be safeguarded when practicable, an employee does not assume the risk of his employer's violation of the requirement, but the burden is on him, in a personal injury action, to affirmatively establish absence of a guard causing his injury, and then the burden falls on the employer to show that the machinery could not have been practicably safeguarded. (Iowa Supreme Court, Winn vs. Town of Anthon, 150 Southwestern Reporter 1036.)

DEFICIENT QUALITY OF CASTINGS.—When a contract for a sale of steel castings requires that they be of certain kind and tensile strength, the buyer, on acting with reasonable promptness in ascertaining any deficiencies in castings delivered by the seller, and by giving the latter prompt notice of refusal to accept them as complying with the agreement, will be entitled to recover such damages as he can show that he has sustained on account of the seller's default. (New York Supreme Court, Appellate Division, Atlanta Machine Works vs. Felthousen, 151 New York Supplement 922.)

CONTRACTOR'S RIGHT AGAINST THIRD PERSON.—When one contracts to construct a completed plant on land belonging to another, he has such interest in the plant before its delivery to the owner as entitles him to maintain suit for injury to it resulting from negligence of a third person. Therefore, under a contract

to construct a pumping plant for a city, the contractor is entitled to recover against a gas company for injury to the plant before it was delivered to the city, caused by an explosion of gas due to negligence imputable to the company. (Connecticut Supreme Court of Errors, H. Wales Lines Company vs. Hartford City Gas Light Company, 93 Atlantic Reporter 129.)

SCOPE OF WORKMEN'S COMPENSATION ACT.—An employee injured or killed in dodging a playful attack made by a co-employee while they are engaged in performing their regular work, receives the injury "in the course of his employment" in the sense that an award becomes due from the employer under the New Jersey workmen's compensation act. (New Jersey Supreme Court, Hulley vs. Moosbrugger, 93 Atlantic Reporter 79.)

CONSTRUCTION OF CONFLICTING PATENTS.—When a patented machine constitutes merely an improvement over an earlier invention the patent will not be given as broad construction in favor of the patentee, on a question of infringement, as is given a patent for an original or basic machine. (United States Circuit Court of Appeals, Fourth Circuit, Lauter & Suter Company vs. Hildreth, 219 Federal Reporter 753.)

COMPLETING CONTRACTOR'S UNFINISHED WORK.—If one who contracted to furnish labor and materials in the installation of a boiler, at a fixed price, delayed for an unreasonably long time in completing the work in a satisfactory manner, the other party to the agreement was entitled to employ someone else to finish the work, and deduct the reasonable expense thereof from the contract price. (New York Supreme Court, Appellate Term, Olney & Warren vs. Daniel Birdsall & Co., 151 New York Supplement 907.)

LIABILITY FOR EXPLOSION OF DYNAMITE.—It constitutes an actionable wrong against persons owning property or residing nearby to keep dynamite stored in a thickly settled community, especially where proximity to a railroad track and slag piles increases the danger of an explosion. (Alabama Supreme Court, Prosch vs. Sloss-Sheffield Steel & Iron Company, 67 Southern Reporter 516.)

NEGLIGENCE OF TRANSFER MEN.—Where a manufacturer intrusted the delivery of radiators to a transfer company under a contract calling for payment according to tonnage hauled by the company, the manufacturer was not liable for injury to a pedestrian who fell over a radiator negligently placed by the transfer company in sidewalk space. The company was an independent contractor and not a mere employee. (Minnesota Supreme Court, Winter vs. American Radiator Company, 151 Northwestern Reporter 277.)

VALIDITY OF CONTRACT CONCERNING PATENT.—The Colorado Court of Appeals (Buffalo Specialty Company vs. Gougar, 144 Pacific Reporter 325) holds that a manufacturer's agreement not to make articles of a certain kind covered by broad claims of patents owned by the other party to the agreement, in consideration of the latter forbearing to sue for claimed infringement of the patents, is invalid, as being against public policy. The decision says: "It is obvious that, if the agreement is enforceable, the defendants are estopped from disputing the validity and scope of the patent named, or any other patent in which plaintiff may be interested, even although absolutely void or useless. The public is vitally interested in having worthless patents that ostensibly create a monopoly in articles extensively used by the people destroyed, and it is against the policy of the law to enforce or give effect to a contract, such as this, which might protect a patentee's claims under such patents, and estop or deter manufacturers and dealers from contesting their validity and scope. * * * The public may be regarded as a part to every suit in which questions of public policy are involved. The right of a litigant to make and rely on that defense, notwithstanding his admissions and stipulations, is not conceded for his protection alone, nor primarily. It is not a private right to the individual only, but is founded on public policy, which is promoted by his making the defense, and contravened by his refusal to make it."

Trade Publications

Electric Hoists, Cranes and Overhead Trolleys and Tramways.—Reading Crane & Hoist Works, Reading, Pa. Bulletins Nos. 1005 to 1008 inclusive, and four folders. The first presents the characteristic constructional features of a line of electric hoists and the others take up in order the hook or pendant, hand-gearred trolley and motor-driven trolley types of 2 to 8 tons capacity. Details of the construction are given with emphasis on accessibility and safety appliances. Double I-beam traveling cranes from 3 to 30 tons capacity and single I-beams from 1 to 10 tons capacity are described in a folder. Another has to do with overhead trolleys and tramways, switches, turntables and I-beam track. A booklet on "R-C" Cost Reducers is a general résumé of all the preceding. All these are illustrated.

Coal Crushers.—Jeffrey Mfg. Company, Columbus, Ohio. Bulletin No. 141. Describes the Jeffrey single roll crusher for reducing large lump and run-of-mine coal to stoker size in a single operation. Some of the points emphasized are accessibility of the crusher roll, the toothed segments of the roll face and a safety device for action when an undue stress comes on the machine from any cause. Two types of portable crushers for use as a loader over conveyor alongside of railroad cars or directly over storage bins are taken up. All types of crushers are illustrated and views of methods of installation are shown. Tables for computing the capacity of these machines are included.

Engines, Boilers and Boiler Supplies.—Houston, Stanwood & Gamble Company, Cincinnati, Ohio. Collection of bulletins. These take up heavy duty, center crank, cross-compound throttling, single valve automatic, rolling mill and portable engines; portable and horizontal tubular boilers; steel casing boiler settings; feed water heaters and purifiers; portable air-compressor outfits and heavy duty and four valve automatic side crank engines with detached outboard bearings. These engines range in size from a minimum of 18 hp. to a maximum of 800 hp.

Hydraulic Tire Setters.—Lourie Mfg. Company, Springfield, Ill. Catalogue No. 19, folders and circulars. Discuss the principles of cold tire setting and the construction and operation of a line of machines which may be used either on tires or steel bands as well as a type for heavier manufacturing work. The folders deal with tire setters, power tamping machines, balers, forge hoods, presses, bulldozers and power pumps. All of these machines are illustrated and described.

Hydraulic Rams and Metallic Packing.—Power Specialty Company, 111 Broadway, New York City. Two catalogues. The first takes up the principle, construction and application of the hydraulic ram where a continuous flow water supply can be established from natural sources. Directions are also included for making surveys for the installation of this device. The second considers Duval plaited wire packing for use in engines, air compressors, vacuum pumps, hydraulic pumps and other heavy service machinery, describing its construction and method of installation. Instructions for ordering are given. Both catalogues are illustrated.

Watchmen's Clocks.—Newman Clock Company, 178 Fulton street, New York City. Folder. Explains with illustrations a watchman's clock, the distinctive feature of which is the recording of time by embossing upon a paper dial the number of a key placed at a patrol point. A special claim for this device is that it cannot be tampered with nor adjusted by the watchman, and that a complete record can be obtained only by using the various keys at the proper times.

Power Plant Oil Filter.—Richardson-Phenix Company, Milwaukee, Wis. Bulletin No. 10. Describes the construction and operation of a power plant oil filter, in which the oil is first heated with a view to lowering its viscosity and thus reducing its ability to retain water and solid particles in suspension. The oil then flows at a low velocity over shallow trays where precipitation takes place and through a set of vertical filtering cloths before passing into the clean oil storage compartment. A section on the necessity of using filters in connection with steam turbine oiling systems that contains considerable new information is included. Illustrations of the filters are presented, together with a number of views of installations and suggested installation schemes. An illustrated description of the filter appeared in *The Iron Age*, April 15, 1915.

Oil Engines.—Allis-Chalmers Mfg. Company, Milwaukee, Wis. Bulletin No. 1532. Pertains to a line of oil engines of the horizontal type which operate on the Diesel principle and use the open fuel injection nozzle. After a discussion of the Diesel system and the advantages of the four-stroke cycle, the open fuel nozzle and the horizontal construction, the design and construction of the engine are

described at some length, the text being supplemented by a number of halftone engravings and line drawings. One of the points upon which special emphasis is laid is that the open nozzle and the self-scavenging chamber of the horizontal engine enables practically any fuel oil to be used.

Air Compressors.—American Air Compressor Works, 26 Cortlandt street, New York City. Bulletin No. 20. Concerned with a solid, self-oiling air compressor that is arranged for either steam or belt drive to supply air at a pressure of from 15 to 110 lb. The various features of the design are briefly touched upon and illustrations of the compressor as arranged for either belt or steam drive are presented, together with tables of specifications.

Firebrick.—Chicago Retort & Fire Brick Company, Commercial National Bank Building, Chicago, Ill. Catalogue. Size, $4\frac{1}{2} \times 6\frac{1}{4}$ in.; pages, 85. Deals with a line of firebrick manufactured in standard and special shapes for a variety of uses. All the shapes are illustrated and tables are given indicating the number of bricks necessary for the construction of arches of various spans and springs. In addition, views of the company's plant are included which portray the several stages in the manufacture of the company's products.

Saws.—Standard Saw & Tool Mfg. Company, Kane, Pa. Catalogue. Treats of a line of inserted and solid tooth and band saws. Illustrations of the various kinds of saws are given with tables of the sizes in which they can be supplied. A discussion of the causes for unsatisfactory service of saws is included together with instructions for the insertion and removal of inserted teeth. Swaging and swage shaping machines are illustrated and briefly described with instructions for their use, and mention is made of a standard combination hammer that will do the work of eight tools.

Steel Tanks.—Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa. Shows a number of tanks that have been supplied by this company to industrial plants for water supply, railroads and municipalities and sprinkler tanks for industrial plants. A list of places where the tanks of this company have been erected is given together with the height of the top of the tank and the capacity.

Transfer Cars and Larries.—Brown Hoisting Machinery Company, 4403 St. Clair avenue, Cleveland, Ohio. Catalogue U. Contains complete information and many illustrations of transfer cars for carrying ore, coal, coke and other bulk materials from handling machines to bins and pits. The cars are operated from the operator's cab by electric motors which also control the dumping apparatus. They are built to meet the needs of the individual purchaser and are also made as bucket transfers for carrying buckets and tubs to cranes and hoisting machines. The larries are provided with scale beams, one for each material to be used, so that exact weight of overload or underload may be ascertained. Illustrations of many cars in use by various plants are included.

Gears.—Woburn Gear Works, Woburn, Mass. Catalogue. Lists a line of brass, steel and iron spur gears and racks; internal, bevel and miter gears; worms and worm wheels, brass ratchets and pawls, sprockets and chains and iron and brass grooved pulleys. Engravings are presented of the various gears, with tables of the sizes of each that can be supplied. In addition to these gears, which are regularly carried in stock, mention is made of the special spiral and helical gears which can be supplied, as well as gears of all kinds and sizes that are made from rawhide and fiber.

Boilers.—S. Freeman & Sons Mfg. Company, Racine, Wis. Catalogue No. 40. Calls attention to a line of high power steam boilers of the horizontal return tubular, Scotch marine, internally fired and water tube types. After a brief discussion of the method of rating the power of boilers, the construction of the horizontal tubular boiler is gone into at some length, the text being supplemented by illustrations of the boiler and some of the machines used in their manufacture and tables of specifications and weights. Lists of dimensions and weights for supporting and connecting breaching for tubular boilers are presented, with tables of the sizes of stacks and the measurements of the boiler settings. The other types of boilers are taken up in the same way, and a number of tables of useful information are included.

Steam Turbines.—Kerr Turbine Company, Wellsville, N. Y. Bulletins Nos. 51 and 52. The first explains the advantages that frequently can be obtained by interposing gears between a turbine and the generator, pump, blower or pulley which it drives and describes the way in which the gears furnished for use with these turbines are made. One of the special points made is that the noise from one of these geared turbines is practically no greater than the windage of a direct-connected outfit. The second bulletin describes and illustrates typical installations of exhaust steam turbines and explains the conditions under which they can be made to produce a greatly increased power output with practically no expense other than the cost of the turbine installation.

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THE IRON AGE

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Prosperity Pointers

Financial authorities are now figuring on the result to this country of the heavy orders coming from abroad for war requirements. The Wall Street Journal, which has made a careful investigation of the situation, is of the opinion that it will be at least a year before the maximum of war orders is reached in our export trade. The effect of these orders was first visible in our statistics of exports for February, or six months after the beginning of the war. Orders received up to this time, and directly connected with arms and ammunition, total not less than \$500,000,000, and this is only a part of the expenditures in this country growing out of the war. The purchases of wheat, provisions, canned goods, etc., are additional, and taking the whole it is believed that for the period of the war not less than \$1,000,000,000 will be realized in the trade balance of this country and it may reach \$1,500,000,000. It is further figured that, with the assured curtailment in American travelers' expenditures in Europe, the foreign trade balance now running in favor of this country may reach the stupendous total of \$2,000,000,000 for the year, or more than three times our previous highest trade balance of \$600,000,000.

The figures given above seem almost incredible, but so also were the statements made regarding the large war orders placed in Canada and this country a few weeks ago, and which were afterward found to be well within the truth. The benefits accruing to this country have already been very great, as is shown by the abundance of money and the heavy demand for stocks and bonds. The railroads are now able to raise the funds with which to make improvements held up for more than two years by dear money and lack of credit. Not long ago a railroad company of the best standing would have been unable to sell bonds even though its officers went on bended knees to capitalists. In the past two weeks the bond market has absorbed many millions of dollars worth of railroad bonds, and others are about to be floated with assurances of success in advance. The business body of this country, therefore, which has so long suffered from stagnation of blood is now feeling a revival of circulation and in due time this will reach the extremities. If the prognostications of a continuance of heavy foreign business are realized, the country may confidently look forward to a revival of prosperity. It is of interest in this connection

to note that Washington advices are to the effect that sentiment is growing in the dominant political party in favor of tariff revision, and that Congress may be urged to take action in December. It is stated that the iron and steel and sugar tariffs may come up for revision. Factors influencing political opinion in this direction are the loss of revenue from import duties and the fear of a flood of cheap European goods after the war. It is an old saying that misfortunes never come singly, and the opposite is also true. If to highly favorable foreign trade there can be added reasonableness in tariff matters and respite from Government interference with business, the period of prosperity will be lengthened.

Possibilities in Iron and Steel Demand

It used to be a favorite diversion in some quarters to compute the prospects of pig-iron production a few decades hence by counting upon a doubling in tonnage every ten years. To practical men the totals reached appeared quite ridiculous, and such assumptions are now quite unpopular. We are now very much in danger, however, of going to the other extreme by assuming that practically all the tendency of the output to increase has disappeared. The figures of the past few years have not carried out the rule at all, but it is premature to cast all the discredit upon the rule; perhaps the production itself has been somewhat at fault. The rule, it must be remembered, was one of very long standing indeed. The doubling could be traced back, roughly, for nearly a century, or to the time when the annual production was not much more than the best day's production in recent times, and through the year 1906 the rule showed no signs of breaking down. For instance, the production in the decade ending 1906 was 165,000,000 tons, against 79,000,000 tons in the decade ending 1896.

Irrespective of the question whether the poor showing in recent years is due to the rule breaking down permanently or is due to the production having been under the average that future years may indicate, it is of interest to see precisely what has occurred. The production in the past 18 months has averaged 24,000,000 tons a year. Assuming purely for the sake of argument that this is to be the average rate in 1915 and 1916, the production in the ten years to end with 1916 would be 250,000,000 tons, against 165,000,000 tons in the preceding decade, an increase of 51 per cent. instead of 100-

per cent. From a full doubling in the present decade there would be a deficit of no less than 85,000,000 tons.

It must be said at once that the average rate of 24,000,000 tons a year during the last 18 months is no criterion for the future. Nine years ago, in 1906, we made more pig iron than that, and nine years is a very long backward step. The production of 1908 represented a backward step of only seven years and yet it was regarded as phenomenally low. The production of 1894 was extremely low in its time, and yet it represented a recession of only six years. For a period not of a year but of 18 months to disclose a backward step of nine years is therefore very impressive, indicating that something has been very seriously out of joint. Seeing how very serious indeed the situation as to demand has been, the question at once arises, why has not the iron and steel industry suffered more severely even than it has? The year 1908 fell between relatively good years, for both in the year before and the year after production was 62 per cent. greater, and besides this, prices on steel commodities at least were not suffered to decline ruinously. As to the year 1894, it is well recalled it made trouble enough.

The answer to the question is that if productive capacity had been increasing in recent years at anything like the rate that formerly obtained, 1914 would have seen its full measure of distress, eclipsing in severity the terrible times that centered around 1894. If, however, capacity has not been increased at anything like the old rate, the industry is in no position to cope with a demand in future at anything like the increasing rate that has obtained in the past.

Including blast furnaces that can be completed this year, the country's pig-iron capacity is probably not far from 36,000,000 tons, in equipment that could operate under fairly favorable, but not abnormally favorable, circumstances. One must go back more than a dozen years to find a capacity half as great, and more than a quarter century to find a capacity one-fourth as great.

To have blast furnaces with physical capacity to make 36,000,000 tons of pig iron in a year is one thing, however, and actually to complete all the arrangements necessary to produce that amount is an entirely different thing—to find the ore, coke and limestone and secure the labor for the blast furnaces, and to make the necessary transactions between merchant furnaces and such steel works as would have to buy iron in case the iron and steel industry as a whole were to operate at a 36,000,000 ton rate. Clearly it would be no easy thing, when the industry, through 18 months of practice, has grown used to a 24,000,000-ton rate, to limber up so as to make a 50 per cent. greater product.

In about six months lake navigation will have closed and then as to the major portion of the iron industry the limit of production for fully a twelve-month hence will have been fixed. To maintain a pig iron production rate of 36,000,000 tons a year would involve the movement each season of considerably more than 50,000,000 tons of Lake Superior ore, yet 40,000,000 tons for the current season has lately been regarded as rather a sanguine forecast in the Lake ore trade.

As to coke, the Connellsburg shipments have risen in the past few months from 200,000 tons a week to 300,000 tons a week, as pig-iron production in the country increased from an 18,000,000-ton rate to a 26,000,000-ton rate. The capacity of the region, in ovens and men, is not known, but it involved a strain in the fore part of 1913 for it to ship about 450,000 tons a week. The available labor is now undoubtedly much less, with very little opportunity for an increase, and the capacity, in ovens placed over their coal, is probably reduced. For the future the iron trade has had no great concern, it being the policy to meet requirements by erecting by-product plants, but there is no reason to suppose that the completed capacity at this date is sufficient for the full blast-furnace requirements. If such were the case, it would mean that by-product plants are being built, or are projected, in excess of the blast-furnace requirements.

To sum up, a pig-iron production rate of 36,000,000 tons a year would be small, rather than large, compared with the rate at which capacity and demand increased steadily until a few years ago, while the iron and steel trade and its related industries would require a notice not of a few months but of many months before it could really operate at its apparent physical capacity. Whether the times will give the industry the requisite notice is a serious question. Things sometimes move quickly. They did so in 1879 and in 1899, and now there is a war which upsets calculations and precedents. Thus far the influence of the war upon men's minds has been to lessen the expectation of any large industrial expansion, but when the expansion does come it will be the more sudden on that very account.

Export Combinations Favored

The advocates of legislation legalizing combinations to facilitate export trade regard the battle as nearly won in view of recent developments in the activities of the Federal Trade Commission. These include a highly significant declaration by Chairman Davies in an address delivered before the Industrial Club of Chicago, also the fact that Commissioner Rublee has gone on record not only in favor of foreign combinations, but of certain specified legislation to legalize them, and the prediction by officials of the commission that its report on this important subject will be submitted in time for action at the next session of Congress.

Mr. Davies' address before the Industrial Club of Chicago, on April 29, is of special significance, not only because of his position as head of the commission, but because what he said was carefully prepared in advance, submitted to his colleagues for criticism, and officially distributed to the press from the commission's headquarters. While the entire speech is of great interest to business men, the following paragraphs are of special importance:

In international commerce a distinctively significant fact of recent years has been the appearance of the International European cartel in foreign trade. The producers of graphite, the silk dyers, the manufacturers of electrical supplies, glue, sewing thread, etc., had international cartel agreements prior to the war for the purpose of distributing the territory of the rest of the world, fixing prices and controlling output.

These are conditions which in the readjustment of world commerce, American industry and enterprise and American polity must consider, if American foreign trade is to develop consistent with the greatness of our resources, our people and our opportunity. It would be a confession of unfitness if this country should be unable to meet conditions such as these in the world trade.

Mr. Davies also commented suggestively upon the cooperation which the commission is receiving from business organizations and gave an official assurance that the commission at all times would be glad to receive not only representatives of organizations, but individual business men who may find themselves facing business problems. In this connection he said:

It has been reassuring and helpful to the members of the Federal Trade Commission to find that some of the great voluntary business organizations of the country have extended to us their proffer of cooperation and support. We appreciate such cooperation and welcome it. It is gratifying to know that every local chamber of commerce, every local merchants' association, and every local business association of whatever kind or character in the United States, has easy access to the Federal Trade Commission of the United States for the presentation of any complaints it may have, or of the difficulties or problems which confront its members. It is our hope to conduct the business of the commission in such a way that it will be so free of legalistic and technical procedure as to enable any business man to come before us in an informal manner.

The Federal Trade Commission knows no politics and has no aims or purposes other than those of seeking to be of constructive aid to business enterprise, both great and small, and to live up to its possibilities as one of the agencies devised by government for the preservation of industrial freedom and opportunity.

Apropos of Commissioner Davies' remarks concerning the cooperation of voluntary business organizations, the interesting fact has recently come to light that Commissioner Rublee, prior to his appointment to the commission, was chiefly instrumental in the drafting of the report of the special committee on trust legislation of the Chamber of Commerce of the United States dealing with the subject of combinations for export trade, which was submitted to the Chamber at its recent convention in Washington. This report strongly advocated the passage by Congress of a special law not only legalizing export combinations, but placing them under the jurisdiction of the commission.

The Chamber of Commerce will urge upon the Trade Commission the legislation proposed in connection with the above report, and will seek to induce the commission to draft a bill for simultaneous introduction in both houses of Congress. It goes without saying that a measure actually prepared by the commission and endorsed by the President would carry great weight with Senators and Representatives, and would stand a better chance of early enactment than would any bill presented by individuals or trade organizations, however influential they might be. The Chamber will suggest, however, that the bill include certain principles which it regards as essential. These are: first, all combinations entered into or carried on in good faith for the sole purpose of increasing export trade which do not tend to restrain or monopolize trade within the United States shall be lawful; second, that the term "export trade" should be con-

fined to trade or commerce from the United States to any foreign nation, excluding all insular possessions of the United States; and third, that the Federal Trade Commission be given the same power with reference to organizations, associations, agreements or acts in connection with export trade which it has reason to believe tend to restrain or monopolize trade within the United States, as it has under the Federal Trade Commission act in the matter of unfair methods of competition.

The Hill Iron Ore Properties in 1914

The eighth annual report of the trustees of the Great Northern Iron Ore Properties for the year ended December 31, 1914, has just been issued. After the payment of 50c. per share, or \$750,000 in the past year, the balance of undistributed receipts is \$3,819,715. The statement of operations under the Great Western Mining Company (Steel Corporation) lease shows that the total shipments of ore from 1907 were 26,573,808 tons, and that the grand total of receipts from the Great Western Mining Company, including freights and interest earnings, was \$45,174,225. The estimated ore on the various properties under the control of the trustees is shown as follows:

	Tons
Lands owned in fee.....	104,321,491
Leaseholds of the first class.....	103,463,096
Leaseholds of the second class.....	4,787,862
	<hr/>
In mines covered by the "Old leases".....	212,572,449
	95,538,846
	<hr/>
Total	308,111,295

On the Dunwoody mine the stripping of 5,800,000 cu. yd. will be finished by October 1 this year, making available 8,000,000 tons of steam shovel ore. From the Hill Annex mine a stripping contract covering 8,500,000 yd. is now being worked. It will make available about 4,300,000 tons of ore. Some ore can be produced in 1916 from this mine. It is stated that under the contract with the Tod-Stambaugh Company, Cleveland, the Arthur Iron Mining Company, which conducts all the Hill operations on the Mesaba range, will receive \$1 per ton royalty for all ore shipped from the Dean mine. This mine is a leasehold of the first class carrying an underlying royalty of 25c. per ton. It contains 8,691,671 tons of iron ore, as estimated by the Minnesota Tax Commission.

The Chicago Section of the American Institute of Mining Engineers held its annual meeting April 30, at the Engineers' Club, Chicago. Following the dinner, at which W. L. Saunders, president of the Institute, was the guest of honor, a general business session was held and officers were re-elected for the ensuing year as follows: Chairman, Robert W. Hunt; vice-chairman, J. A. Ede; secretary-treasurer, H. W. Nichols, and additional members of the executive committee, F. K. Copeland and G. M. Davidson. President Saunders made an address, in which he emphasized the breadth of the mining engineer's profession. Carl Scholz, vice-president Consolidated Indiana Coal Company and manager of the mining department of the Rock Island Railroad, spoke of the unsatisfactory selling conditions which confront the coal operators of Indiana and Illinois. The programme closed with a descriptive address by John Brunner of the Illinois Steel Company, in which the process of making rails was explained and illustrated with motion pictures.

A Canadian correspondent writes *The Iron Age* telling of the annoyances to which manufacturers there are subjected in the active efforts of manufacturers in the United States to get business in connection with the building of new Canadian plants. Correspondents here are reminded that it is useless to inclose stamped reply postal cards or stamped addressed envelopes, where United States stamps are used. Attention is also called to the fact that there is no such thing as a "day letter" in Canada, and any telegraphic message sent by "day letter" will be charged at full rates.

Allis-Chalmers Mfg. Company's Year

The report for the first complete year of operation of the Allis-Chalmers Mfg. Company, following the reorganization, shows a loss amounting to \$25,068, as compared with a surplus for the nine months covered in an earlier report, of \$755,125. The decline in orders began in August, 1913, and during the first part of 1914 was particularly severe. Maintenance charges and depreciation reserves have been set aside regularly and the plants and machinery have all been kept up to a high standard. Orders for war materials and some municipal work recently taken greatly improve the outlook. The income account is given as follows:

	1914	1913
Sales billed	\$10,323,150	\$11,127,621
Operating charges, including depreciation	9,221,174	9,503,472
Factory profit	\$1,101,976	\$1,624,149
Administrative and general expenses	1,379,685	1,017,552
Net manufacturing profit	* \$277,709	\$606,597
Other income	252,640	148,528
Net profit	* \$25,068	\$755,125

*Covers period from April 16 to December 31.

*Deficit.

The condensed balance sheet shows:

	Assets	1914	1913
Real estate plant, etc.	\$10,206,028	\$11,366,271	
Property not required for operations	802,452	915,303	
Patents, good will, etc.	19,615,804	19,761,730	
Allis-Chalmers voting trust certificates	406,135	406,135	
Notes and accounts receivable	3,445,624	4,972,467	
Inventory	4,149,243	4,889,171	
Securities owned	3,881,851	2,102,088	
Cash	776,734	1,274,423	
Unexpired insurance premiums	849,015	22,124	
Bullock Electric bonds	849,015	.....
Total	\$44,146,064	\$45,709,716	
	Liabilities	1914	1913
Preferred stock	\$16,500,000	\$16,500,000	
Common stock	26,000,000	26,000,000	
Bullock Elec. Co. stocks	.....	1,170,600	
Accounts payable	210,508	319,003	
Allowances to complete contracts	248,833	407,137	
Payroll accrued	177,513	173,194	
Taxes accrued	121,509	145,166	
Reserves	157,643	141,490	
Profit and loss surplus	730,056	755,125	
Total	\$44,146,064	\$45,709,716	

Westinghouse Air Brake Order for War Materials

The American Locomotive Company, which recently received a contract for 5,000,000 high explosive and shrapnel shells for the Allies, has placed one-fourth of the order with the New York Air Brake Company and one-fourth with the Westinghouse Air Brake Company. The latter, in order to turn out its portion of the order, has erected at its works at Wilmerding, Pa., two temporary buildings, one 65 x 175 ft. and another 65 x 500 ft., in which are being installed the necessary lathes, planers, milling machines and other machinery. The company states that it has bought all the machinery it will need for filling this new order, and expects to complete it in 14 months. The contract does not contain any cancellation clause in the event of the war being terminated, but the entire order will be filled. The Westinghouse Company reports a slightly better demand for its products from the railroads. Its entire plant at Wilmerding is now running about five days a week, which is a larger rate of operation than it has had for some months.

The British Empire's total trade with foreign countries in 1913, according to the Statistical Abstract of the British Empire, was \$7,577,914,300, made up of \$4,114,504,100 imports and \$3,463,410,200 exports. The United Kingdom's trade with other parts of the British Empire was \$1,172,291,200 imports and \$1,126,915,900 exports, the intercolonial trade imports being \$384,755,200, making a total interimperial trade of \$2,683,962,300. The grand total of empire and interimperial trade was \$10,261,876,600, the percentages being foreign trade 73.8 and interimperial trade 26.2 per cent.

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MACHINE TOOL BUILDERS

Interesting Programme for the Coming Spring Convention at Atlantic City

The spring meeting of the National Machine Tool Builders' Association will be held at the Marlboro-Blenheim, Atlantic City, Thursday and Friday, May 20 and 21. The opening session Thursday morning will be devoted to the usual routine of business, a paper by Robert T. Kent of Industrial Engineering on "The Application and Use of Time Study Data," and one by Harold C. White, superintendent of assembling, Pierce-Arrow Motor Car Company, Buffalo, N. Y., on "How Profitably to Operate a Night Force." Thursday afternoon and Friday morning will be given up to committee meetings. At the Friday afternoon session A. M. Tilton, president of the Drop Forging Company of New York, will read a paper on "Drop Forgings," and George Grafton Wilson, professor of international law of Harvard University, will deliver an address on "Neutrality."

APRIL GAIN IN PIG IRON

Output 6000 Tons More Than in March

Capacity Active May 1 Close to That of One Month Previous

April ended with pig-iron production only about 1300 tons a day more than at its beginning. The output for the month was 2,116,494 tons, or 70,550 tons a day, compared with 2,063,834 tons in March, a 31-day month, or 66,575 tons a day. There was a net gain of four furnaces in the month, or from 191 to 195, and the capacity active on May 1 was 71,385 tons a day, as against 70,091 tons a day one month previous. The indications are that the production will increase but little from the 71,385-ton rate in the coming month.

DAILY RATE OF PRODUCTION

The daily rate of production of coke and anthracite pig iron by months, from April, 1914, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel works	Merchant	Total
April, 1914	54,508	21,157	75,665
May	47,028	20,478	67,506
June	44,321	19,595	63,916
July	45,027	18,123	63,150
August	46,937	17,426	64,363
September	46,344	16,409	62,753
October	41,026	16,335	57,361
November	35,305	15,306	50,611
December	33,381	15,515	48,896
January, 1915	35,998	15,661	51,659
February	44,192	15,621	59,813
March	50,036	16,539	66,575
April	52,804	17,746	70,550

OUTPUT BY DISTRICTS

The accompanying table gives the production of all coke and anthracite furnaces in April and the three months preceding:

Monthly Pig-Iron Production—Gross Tons

	Jan.	Feb.	Mar.	Apr.
	(31 days)	(28 days)	(31 days)	(30 days)
New York	121,292	113,509	138,539	156,449
New Jersey	6,564	6,096	6,738	6,592
Lehigh Valley	62,205	52,384	61,116	62,673
Schuylkill Valley	40,691	39,756	50,814	50,556
Lower Susquehanna and Lebanon Valley	32,535	31,901	34,267	32,581
Pittsburgh district	370,745	429,771	537,541	497,890
Shenango Valley	66,184	80,922	95,229	101,172
Western Pennsylvania	122,713	116,524	129,657	132,619
Maryland, Virginia and Kentucky	33,481	27,828	40,680	38,860
Wheeling district	54,563	60,692	82,249	84,700
Mahoning Valley	171,624	182,912	247,580	281,742
Central and Northern Ohio	119,349	134,640	159,566	162,445
Hocking Valley and Hanging Rock	24,317	25,822	27,511	19,985
Chicago district	155,038	174,346	236,274	289,259
Mich., Minn., Mo., Wis. and Col.	60,218	60,787	66,921	63,712
Alabama	144,985	126,289	136,820	129,457
Tennessee	14,917	10,592	12,382	14,763
Total	1,601,421	1,674,771	2,063,834	2,116,494

PRODUCTION OF STEEL COMPANIES

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in the figures below, together with ferromanganese and spiegel-eisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Pig, total production				Spiegeleisen and ferromanganese	
	1913	1914	1915	1913	1914	1915
Jan.	1,981,560	1,261,430	1,115,944	15,633	17,325	18,041
Feb.	1,792,154	1,329,414	1,237,380	20,131	10,524	13,319
Mar.	1,904,878	1,704,688	1,551,082	20,546	20,133	12,274
Apr.	1,939,751	1,635,226	1,584,111	23,108	18,676	12,337
May	1,991,192	1,457,847	1,042	21,504	.....	.....
June	1,860,070	1,329,623	.....	19,212	16,254	.....
July	1,840,216	1,395,851	.....	22,310	16,524	.....
Aug.	1,833,352	1,455,054	.....	20,680	11,577	.....
Sept.	1,828,232	1,390,322	.....	24,555	13,786	.....
Oct.	1,848,634	1,271,820	.....	19,499	17,435	.....
Nov.	1,573,007	1,059,159	.....	26,765	21,977	.....
Dec.	1,298,262	1,034,802	.....	14,095	20,733	.....

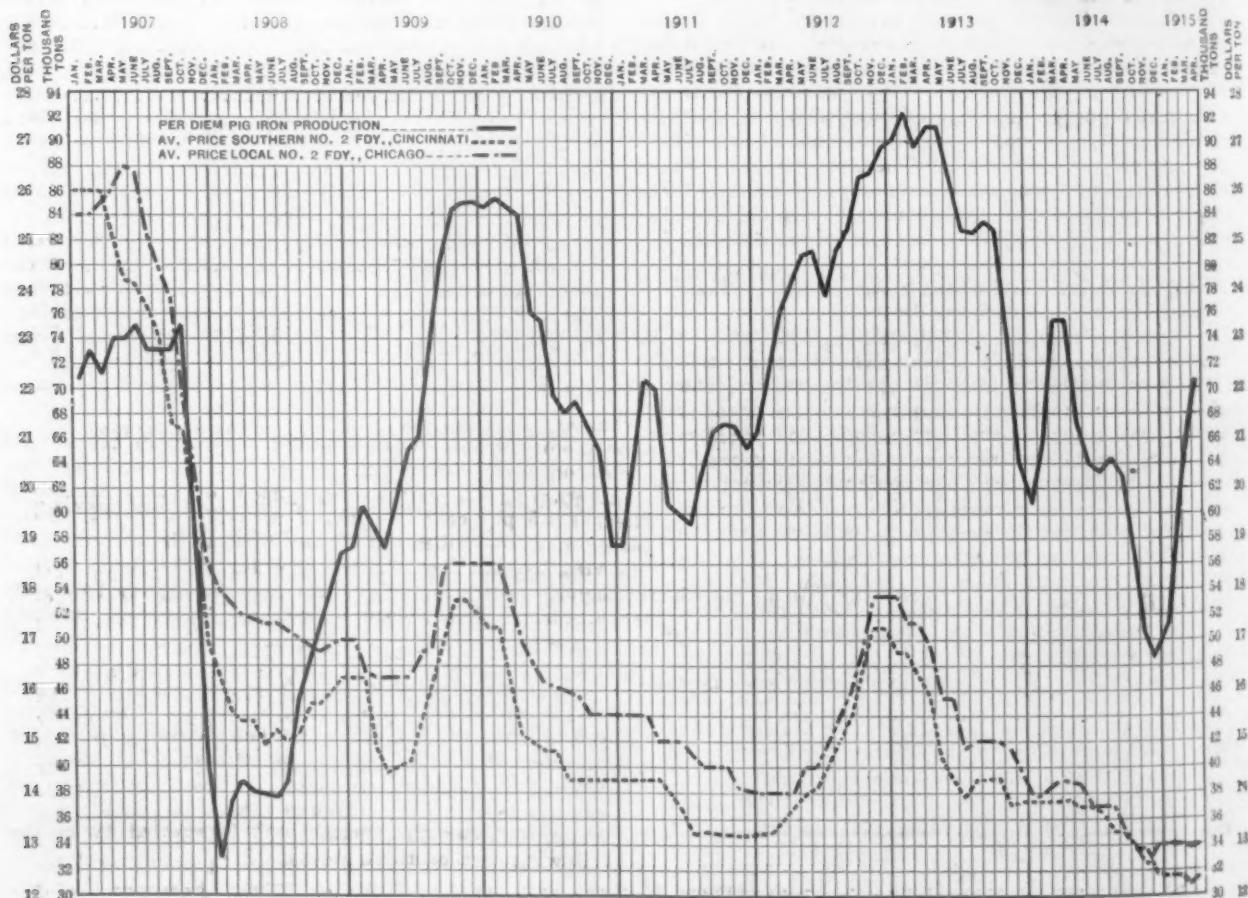


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to May 1, 1915; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

CAPACITY IN BLAST MAY 1 AND APRIL 1

The following table shows the daily capacity in gross tons of furnaces in blast May 1 and April 1, by districts:

Location of furnaces	Total number of stacks	May 1		Apr. 1	
		Number in blast	Capacity per day	Number in blast	Capacity per day
<i>New York:</i>					
Buffalo	19	14	5,069	12	4,274
Other New York	7	2	429	2	450
New Jersey	7	1	219	1	217
<i>Pennsylvania:</i>					
Lehigh Valley	22	8	1,913	8	1,840
Spiegel	2	2	210	2	199
Schuylkill Val.	15	5	1,679	5	1,704
Lower Susquehanna	7	2	522	2	502
Lebanon Valley	10	2	419	3	603
Pittsburgh Dist.	52	36	16,984	25	17,030
Ferro	4	1	112	1	102
Shenango Val.	19	9	3,707	8	3,140
Western Penn.	27	15	4,428	15	4,532
Maryland	3	1	458	1	439
Ferro	1	1	89	1	95
Wheeling Dist.	11	7	2,823	7	2,815
<i>Ohio:</i>					
Mahoning Val.	25	21	9,391	21	9,289
Central and Northern	24	13	5,087	13	5,470
Hocking Val. & Hang'g Rock	15	4	463	6	887
Illinois and Ind.	34	19	9,308	17	8,460
Ferro	2	0	0	0	0
Michigan, Wis. & Minn.	10	5	1,371	5	1,458
Colo. and Mo.	7	2	753	2	787
<i>The South:</i>					
Virginia	24	5	587	4	550
Kentucky	5	1	223	1	228
Alabama	46	15	4,649	15	4,557
Tennessee	20	4	492	4	463
Total	418	195	71,385	191	70,091

Among the furnaces blown in in April were two Lackawanna in the Buffalo district, one McKeesport in the Pittsburgh district, one New Castle in the Shenango Valley, Perry in western Pennsylvania, one Low Moor in Virginia, one Lorain in Ohio and one Federal and one Joliet in the Chicago district.

The furnaces blown out last month were Robesonia in the Lebanon Valley, one Central in northern Ohio and Belfont and Marting in the Hanging Rock district.

DIAGRAM OF PIG-IRON PRODUCTION AND PRICES

The fluctuations in pig-iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of *The Iron Age*. The figures for daily average production, beginning January, 1908, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1908—

Gross Tons						
1908	1909	1910	1911	1912	1913	1914
Jan.	33,918	57,975	84,148	56,752	66,354	90,172
Feb.	37,163	60,976	85,616	64,090	72,442	92,369
Mar.	39,619	59,232	84,459	70,036	77,591	89,147
Apr.	38,289	57,962	82,792	68,836	79,181	91,759
May	37,603	60,752	77,102	61,079	81,051	91,039
June	36,444	64,656	75,516	59,585	81,358	87,619
July	39,287	67,793	69,305	57,841	77,738	82,601
Aug.	42,851	72,546	67,963	62,150	81,046	82,057
Sept.	47,300	79,507	86,476	65,903	82,128	83,531
Oct.	50,554	83,858	67,520	67,811	86,722	82,133
Nov.	51,595	84,917	63,659	66,648	87,697	74,453
Dec.	56,158	85,022	57,349	65,912	89,766	63,987
						48,896

THE RECORD OF PRODUCTION

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1911—Gross Tons

	1911	1912	1913	1914	1915
Jan.	1,759,326	2,057,911	2,795,331	1,885,054	1,601,421
Feb.	1,794,509	2,100,815	2,586,337	1,888,670	1,674,771
Mar.	2,171,111	2,405,318	2,763,563	2,347,867	2,063,824
Apr.	2,064,086	2,375,436	2,752,761	2,269,955	2,116,494
May	1,893,456	2,512,582	2,822,217	2,092,686	.....
June	1,787,566	2,440,745	2,628,565	1,917,783	.....
July	1,793,068	2,410,889	2,560,646	1,957,645	.....
Aug.	1,926,637	2,512,431	2,545,763	1,995,261	.....
Sept.	1,997,102	2,463,839	2,505,927	1,882,577	.....
Oct.	2,102,147	2,689,933	2,546,261	1,778,186	.....
Nov.	1,999,433	2,630,854	2,233,128	1,518,316	.....
Dec.	2,043,270	2,782,737	1,983,607	1,515,752	.....

The first heat of steel from the 50-ton furnace of the new plant of the Broken Hill Proprietary Company, at New Castle, New South Wales, is reported as having been successfully poured April 9.

Blast Furnace Notes

The National Tube Company started its No. 4 blast furnace at McKeesport, Pa., last week, making three out of the four in blast there. The company is also operating four out of five stacks at Lorain, Ohio, but its two Riverside furnaces at Wheeling, W. Va., are idle.

On May 1 the Carnegie Steel Company had 39 blast furnaces active, out of a total of 58, No. 3 stack at New Castle, Pa., having gone in on April 23. It is expected that No. 4 stack at New Castle will be blown out this month for needed repairs.

The Lackawanna Steel Company blew in two furnaces at Buffalo in April, and now has its five large capacity stacks in blast.

Robesonia furnace at Robesonia, Pa., was blown out May 1 and will be replaced by an entirely new stack, for which contracts were let some time ago.

The one active furnace of the Marting Iron & Steel Company, Ironton, Ohio, was closed down for repairs April 22 and is still idle.

Russian Steel Trade in 1914

Russia's pig-iron production in 1914 is estimated at 4,270,000 metric tons against 4,555,000 tons in 1913. The falling off was entirely in the last half. The furnaces in Poland were closed by the war while those in the Ural and Moscow districts suffered. In South Russia the pig-iron output was 3,008,000 tons in 1914 and 3,050,000 tons in 1913; that of finished iron and steel, 2,314,000 tons in 1914 and 2,275,000 tons in 1913. The number of furnaces in operation January 1, 1914, in South Russia was 50; on January 1, 1915, only 43 were running out of 60, three having been built in the year.

Foundry iron which was quoted at \$21.42 at works on January 1, 1914, was \$22.39 December 31. Steel-making iron rose from \$19.71 January 1, 1914, to \$20.08 July 1, and \$20.38 December 31. Steel ingots were quoted at \$32.36 throughout the year, and heavy rails at \$34.06.

The development of a new metal known as Titan bronze makes it possible to manufacture drop forged bronze in place of brass castings. The Titan Metal Company, 1124 Real Estate Trust Building, Philadelphia, controls the process of manufacturing the metal, and has granted an exclusive license for the manufacture of finished castings and casting ingots to the Alpha Metals Company, Bellefonte, Pa. Titan bronze has a tensile strength of 75,000 to 85,000 lb., an elastic limit of 40,000 to 48,000 lb., reduction of area, 45 to 50 per cent. and elongation 22 to 30 per cent., thus enabling its use in many places where steel has been used but where bronze would have been preferable, with the added advantage of its corrosive resisting qualities. The metal can be worked hot. Besides its suitability for making drop forgings, hot rolled thread bolts, screws, gears, pinions, etc., a valuable application is for bronze covered iron and steel sheets to resist corrosion.

The number of unemployed in Germany at the end of January, according to the Reichsarbeitsblatt, the journal of the German Department of Labor Statistics, was 6.5 per cent., compared with 7.2 per cent. at the close of December and 4.7 per cent. at the close of January, 1914. The returns were furnished by 37 trades unions having an aggregate membership of 1,319,368, exclusive of men serving with the naval and military forces.

Fire was lighted in one of the open-hearth furnaces of the new plant of the Central Steel Company, Massillon, Ohio, May 3, the event being celebrated by the presence of a large number of citizens. The company expects to start making steel in about two weeks, or as soon as the first furnace is dried out. Its other two 50-ton open-hearth furnaces will be started up in the following two or three weeks.

The third annual convention of the National Association of Corporation Schools will be held in Worcester, Mass., June 8 to 11.

The Iron and Metal Markets

EXPORTS HOLD UP PRICES

Car Demand May Now Become a Factor

Speculative Buying of Pig Iron Helps to Advance the Southern Market

With little change in the rate of new buying at home, the steel trade has entered May with more grounds for confidence in the outlook than existed one month ago. In the main this is due to the very heavy foreign business distributed here in April and the further large volume on which negotiations are now being closed. To this is now added the belated promise of freer buying of railroad equipment.

Knowing that much more steel for export will be turned out at their mills in May and June than in March and April, steel makers have been little disposed to add to their bookings by price concessions. Hence with many of them April did not equal March in new orders or shipments. War and other export business becomes thus the pivotal factor at a time when hesitation might have developed in a purely domestic situation.

Bids are asked, or are about to be asked, on 18,000 cars, in addition to the 16,000 for the Pennsylvania Railroad. Being chiefly for Western roads, the expected buying of these cars has helped the Chicago market, which has long lagged, being out of the zone of export operations. The Pennsylvania rail order, it is now stated, will be for 138,000 tons, of which 65,000 tons is for the Lines West. The Rock Island will probably buy 10,000 tons at once. At Pittsburgh 5700 tons will be rolled for the Pittsburgh & Lake Erie.

Steel works operations are now averaging nearer to 75 than to 70 per cent. The Steel Corporation's schedules for this week are at 73.5 per cent. of ingot capacity. Foreign orders may bring this up slightly as the month advances. The statement of unfilled orders as of April 30 is not likely to show much change. At Chicago the leading producer had a net gain in April of 25,000 tons.

The pig-iron statistics for April show that steel companies increased their output by 2800 tons a day and merchant furnaces by 1200 tons a day, bringing the latter up to the highest point since July, 1914. The total production in April was 2,116,494 tons, or 70,550 tons a day, against 2,063,834 tons in March, or 66,575 tons a day. With 195 furnaces in blast May 1, or four more than on April 1, the active capacity was 71,385 tons a day, a gain of 1300 tons.

The pig-iron market of late, for the first time in many months, has indicated the state of the whole industry. Buying has broadened, and it is significant that 200,000 tons of speculative iron has been taken. Buyers of this iron, of which about 125,000 tons was from Buffalo furnaces, will hold it for a substantial advance. In Alabama April sales of fully 300,000 tons, including speculative lots, stiffened the market and \$9.75 and \$10 are now asking prices for the second half. Preceding the advance some sales of No. 2 iron were made at \$9.25, and to-day \$9.50 iron is still to be had for the second quarter.

Chicago pig-iron sales have been quite heavy and all Central Western markets have been fairly active. At Chicago the \$12.50 price on Northern iron has been for some time the sign of a weak market, but \$13 is now general. In northern Ohio as low as \$12.25 at furnace for No. 2 foundry has come out.

In finished material, the bar market is of chief interest for the firmness imparted by the large buying of shrapnel steel, just as agricultural bar contracts are coming up. It is believed that 1.20c. will be the basis of these implement contracts for the last six months of the year, and some mills are averse to selling for 12 months.

An advance in steel tubing was made this week, amounting to \$2 on merchant pipe and boiler tubes and \$1 on line pipe in the case of the leading producer. Some independent makers have not advanced line pipe. In iron pipe and boiler tubes a \$2 advance has also been made by most producers, and on galvanized iron pipe one interest has put up its prices \$4 a ton.

Fabricating companies did poorly in April, but in the past week Eastern business has increased and in some cases \$1 a ton higher has been secured in a market that has long seemed bottomless.

Sheet business has been light, but in galvanized sheets prices advance as spelter continues to soar, and 3.40c. is now minimum for No. 28, with 3.50c. common and from that up to 3.75c.

Reports of Russian contracts for rails and equipment persist, the requirements of the former being put above 150,000 tons. Rail mills in Great Britain which have had little to do in months have counted on getting a large part of these rails. The car orders, it is understood, have been practically placed in the United States.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month, and one year previous.

	May 5, Apr. 28	Apr. 7, May 6,		
Pig Iron, Per Gross Ton:	1915.	1915.	1915.	1914.
No. 2 X, Philadelphia.	\$14.25	\$14.25	\$14.25	\$15.00
No. 2, Valley furnace.	12.75	12.75	12.75	13.00
No. 2 Southern, Cin'tl.	12.40	12.40	12.15	13.75
No. 2, Birmingham, Ala.	9.50	9.50	9.25	10.50
No. 2, furnace, Chicago*.	13.00	13.00	13.00	14.25
Basic, del'd, eastern Pa.	13.25	13.25	13.50	14.25
Basic, Valley furnace.	12.50	12.50	12.50	13.00
Bessemer, Pittsburgh.	14.55	14.55	14.55	14.90
Malleable Bess, Ch'go*.	13.00	13.00	13.00	14.25
Gray forge, Pittsburgh.	13.45	13.45	13.45	13.65
L. S. charcoal, Chicago.	15.75	15.75	15.75	15.75

	Billets, etc., Per Gross Ton:	20.00	20.00	20.00	20.00
Bess. billets, Pittsburgh.	20.00	20.00	20.00	20.00	
O-h. billets, Pittsburgh.	20.00	20.00	20.00	20.00	
O-h. sheet bars, P'gh.	21.00	21.00	21.00	21.00	
Forging billets, base, P'gh.	25.00	25.00	25.00	25.00	
O-h. billets, Phila.	22.02	22.02	21.52	22.40	
Wire rods, Pittsburgh.	25.00	25.00	25.00	26.00	

	Finished Iron and Steel,	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25	
Iron bars, Philadelphia.	1.17 1/2	1.15	1.15	1.20	
Iron bars, Pittsburgh.	1.20	1.20	1.20	1.30	
Iron bars, Chicago.	1.15	1.15	1.15	1.10	
Steel bars, Pittsburgh.	1.20	1.20	1.20	1.15	
Steel bars, New York.	1.369	1.369	1.319	1.31	
Tank plates, Pittsburgh.	1.15	1.15	1.15	1.15	
Tank plates, New York.	1.319	1.319	1.269	1.31	
Beams, etc., Pittsburgh.	1.20	1.20	1.20	1.15	
Beams, etc., New York.	1.369	1.369	1.269	1.31	
Skelp, grooved steel, P'gh.	1.12 1/2	1.12 1/2	1.12 1/2	1.20	
Skelp, sheared steel, P'gh.	1.17 1/2	1.17 1/2	1.17 1/2	1.25	
Steel hoops, Pittsburgh.	1.25	1.25	1.25	1.25	

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

	May 5.	Apr. 28.	Apr. 7.	May 6.
Sheets, Nails and Wire,	1915.	1915.	1915.	1914.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh.	1.80	1.80	1.80	1.85
Galv. sheets, No. 28, P'gh.	3.40	3.25	3.30	2.85
Wire nails, Pittsburgh...	1.55	1.55	1.60	1.60
Cut nails, Pittsburgh...	1.55	1.55	1.55	1.65
Fence wire, base, P'gh...	1.35	1.35	1.40	1.40
Barb wire, galv., P'gh...	2.10	2.10	2.10	2.00

Metals,	Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York...	21.00	21.00	17.25	14.50	
Electrolytic copper, N. Y.	18.62 1/2	18.62 1/2	15.87 1/2	14.20	
Spelter, St. Louis...	14.00	13.75	9.37 1/2	4.85	
Spelter, New York...	14.25	14.00	9.62 1/2	5.00	
Lead, St. Louis...	4.07 1/2	4.10	4.12 1/2	3.80	
Lead, New York...	4.20	4.20	4.20	3.90	
Tin, New York...	39.00	42.00	47.25	33.10	
Antimony, Hallett's, N. Y.	35.00	32.00	32.00	6.75	
Tin plate, 100-lb. box, P'gh	3.15	3.25	3.25	3.30	

Coke, Connellsburg,

Per Net Ton at Oven:	\$1.50	\$1.50	\$1.50	\$1.85
Furnace coke, prompt...	1.65	1.65	1.65	2.00
Furnace coke, future...	2.00	2.00	2.00	2.40
Foundry coke, prompt...	2.15	2.15	2.15	2.50

Old Material, Per Gross Ton:

Iron rails, Chicago...	11.75	11.75	12.00	12.75
Iron rails, Philadelphia...	14.50	14.00	13.00	15.50
Carwheels, Chicago...	9.75	9.75	9.75	11.50
Carwheels, Philadelphia...	11.00	11.00	11.00	11.75
Heavy steel scrap, P'gh.	11.75	11.75	12.00	11.50
Heavy steel scrap, Phila.	11.00	11.00	11.00	10.50
Heavy steel scrap, Ch'go	9.25	9.25	9.00	10.00
No. 1 cast, Pittsburgh...	12.00	12.00	12.00	11.50
No. 1 cast, Philadelphia...	11.75	11.75	12.00	12.50
No. 1 cast, Ch'go (net ton)	9.00	9.00	9.00	10.25

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal has no stability, being dependent on vessel charges.

Plates.—Tank plates, $\frac{1}{4}$ in. thick, 6 $\frac{1}{4}$ in. up to 100 in. wide, 1.15c. base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, $\frac{1}{4}$ in. and over on thinnest edge, 190 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft. are considered $\frac{1}{4}$ -in. plates. Plates over 72 in. wide must be ordered $\frac{1}{4}$ in. thick on edge or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gauges under $\frac{1}{4}$ in. to and including 3-16 in...	10
Gauges under 3-16 in. to and including No. 8...	15
Gauges under No. 8 to and including No. 9...	25
Gauges under No. 9 to and including No. 10...	30
Gauges under No. 10 to and including No. 12...	40
Sketches (including straight taper plates), 3 ft. and over...	10
Complete circles, 3 ft. in diameter and over...	20
Boiler and flange steel...	10
"A. B. M. A." and ordinary firebox steel...	20
Still bottom steel...	30
Marine steel...	40
Locomotive firebox steel...	50
Widths over 100 in. up to 110 in., inclusive...	5
Widths over 110 in. up to 115 in., inclusive...	10
Widths over 115 in. up to 120 in., inclusive...	15
Widths over 120 in. up to 125 in., inclusive...	25
Widths over 125 in. up to 130 in., inclusive...	50
Widths over 130 in...	1.00
Cutting to lengths under 3 ft. to 2 ft., inclusive...	25
Cutting to lengths under 2 ft. to 1 ft., inclusive...	50
Cutting to lengths under 1 ft...	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

Wire Products.—Prices to jobbers: Fence wire, Nos. 10 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots, annealed, \$1.35 to \$1.40; galvanized, \$1.90. Galvanized barb wire and staples, \$2.10; painted, \$1.60. Wire nails, \$1.55 to \$1.60. Galvanized nails, 1 in. and longer, \$1.20 advance over base price; shorter than 1 in., \$1.70 advance over base price. Woven wire fencing, 72 per cent. off list for carloads; 71 off for 1000-rod lots; 70 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.									
Nos.	0 to 9	10	11	12 & 12 1/2	13	14	15	16	
Annealed	\$1.50	\$1.55	\$1.60	\$1.65	\$1.75	\$1.85	\$1.95	\$2.05	
Galvanized	2.00	2.05	2.10	2.15	2.25	2.35	2.75	2.85	

Wire Rods.—Bessemer, open-hearth and chain rods, \$25.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, $\frac{1}{4}$ in. thick and over, and zees, 3 in. and over, 1.20c. Extras on other shapes and sizes are as follows:

Cents per lb.	
I-beams over 15 in...	.10
H-beams over 18 in...	.10
Angles over 6 in., on one or both legs...	.10
Angles, 2 in. on one or both legs less than $\frac{1}{4}$ in. thick as per steel bar card, Sept. 1, 1909...	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)...	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909...	.20 to .80
Deck beams and bulb angles...	.30
Handrail tees...	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive...	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive...	.50
Cutting to lengths, under 1 ft...	.55
No charge for cutting to lengths 3 ft. and over.	

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from May 1, 1915, all full weight:

Steel		Iron	
Inches	Black	Inches	Black
$\frac{1}{8}$, $\frac{1}{4}$ and $\frac{3}{8}$...	72	$\frac{1}{8}$ and $\frac{1}{4}$...	64
$\frac{1}{2}$...	76	$\frac{1}{8}$...	64
$\frac{3}{4}$ to 3...	79	$\frac{1}{2}$...	68
		$\frac{3}{4}$ to $2\frac{1}{2}$...	71

Lap Weld

2	76	$65\frac{1}{2}$	$1\frac{1}{4}$	55	41
$2\frac{1}{2}$ to 6	78	$67\frac{1}{2}$	$1\frac{1}{2}$	66	52
7 to 12	76	$65\frac{1}{2}$	2	67	54
13 and 14	62 $\frac{1}{2}$	$65\frac{1}{2}$	$2\frac{1}{2}$ to 4	69	57
15	60	$65\frac{1}{2}$	$4\frac{1}{2}$ to 6	69	57
			7 to 12	67	57

Reamed and Drifted	
1 to 3, butt...	77
2, lap...	76
$2\frac{1}{2}$ to 6, lap...	76
7 to 8...	76
9 to 12...	77

Butt Weld, extra strong, plain ends

$\frac{1}{8}$, $\frac{1}{4}$ and $\frac{3}{8}$...	67	$54\frac{1}{2}$	$\frac{1}{8}$...	61	48
$\frac{1}{2}$...	72	$63\frac{1}{2}$	$\frac{1}{2}$...	66	56
$\frac{3}{4}$ to $1\frac{1}{2}$...	76	$67\frac{1}{2}$	$\frac{3}{4}$ to $1\frac{1}{2}$...	70	58
2 to 3...	77	$68\frac{1}{2}$	2 and $2\frac{1}{2}$...	71	59

Lap Weld, extra strong, plain ends

2	73	$62\frac{1}{2}$	$1\frac{1}{2}$	65	53
$2\frac{1}{2}$ to 4	75	$64\frac{1}{2}$	2	67	54
$4\frac{1}{2}$ to 6	74	$63\frac{1}{2}$	$2\frac{1}{2}$ to 4	69	57
7 to 8	68	$57\frac{1}{2}$	$4\frac{1}{2}$ to 6	68	56
9 to 12	63	$52\frac{1}{2}$	7 to 8	61	51
		$52\frac{1}{2}$	9 to 12	56	46

To the large jobbing trade an additional 5 per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts on less than carloads, f.o.b. Pittsburgh, freight to destination added, in effect from May 1, 1915, are as follows:

Lap Welded Steel	Standard Charcoal Iron
$1\frac{1}{2}$ and 2 in...	65
$2\frac{1}{2}$ in...	42
$2\frac{1}{2}$ and $2\frac{1}{2}$ in...	68
3 and $3\frac{1}{2}$ in...	73
$3\frac{1}{2}$ and $4\frac{1}{2}$ in...	74
5 and 6 in...	67
7 to 13 in...	64

Locomotive and steamship special charcoal grades bring higher prices.

1 $\frac{1}{2}$ in., over 18 ft., 10 per cent. net extra.

2 in. and larger, over 22 ft., 10 per cent. net extra.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets		Cents per lb.
Nos. 3 to 8		1.25 to 1.30
Nos. 9 to 10		1.30 to 1.35
Nos. 11 and 12		1.35 to 1.40
Nos. 13 and 14		1.45 to 1.50
Nos. 15 and 16		1.55 to 1.60

Box Annealed Sheets, Cold Rolled		Cents per lb.
Nos. 10 and 11		1.45 to 1.50
No. 12		1.45 to 1.50
Nos. 13 and 14		1.50 to 1.55
Nos. 15 and 16		1.55 to 1.60
Nos. 17 to 21		1.60 to 1.65
Nos. 22 and 24		1.65 to 1.70
Nos. 25 and 26		1.70 to 1.75
No. 27		1.75 to 1.80
No. 28		1.80 to 1.85
No. 29		1.85 to 1.90
No. 30		1.95 to 2.00

Galvanized Sheets of Black Sheet Gauge		Cents per lb.
Nos. 10 and 11		2.40 to 2.50
No. 12		2.50 to 2.60
Nos. 13 and 14		2.50 to 2.60
Nos. 15 and 16		2.65 to 2.75
Nos. 17 to 21		2.80 to 2.90
Nos. 22 and 24		2.95 to 3.05
Nos. 25 and 26		3.10 to 3.20
No. 27		3.25 to 3.35
No. 28		3.40 to 3.50
No. 29		3.55 to 3.65
No. 30		3.70 to 3.80

Pittsburgh

PITTSBURGH, PA., May 4, 1915.

The long-deferred rail inquiry of the Pennsylvania Railroad has finally come out. Bids on over 16,000 cars for the same road are to close May 15. The market looks stronger than last week. The steel mills report a fair amount of new business on plates, shapes and bars at the 1.20c. price for May and June shipment, and they have taken some contracts for these products for third quarter at 1.25c. New orders booked in April were not so large as in March, and shipments were also lighter, notably in the wire trade. As yet there has been no decrease in the rate of operations among the steel mills. Local companies, such as Westinghouse Air Brake, Westinghouse Electric, Carnegie, Jones & Laughlin, Crucible Steel, Wheeling Mold & Foundry and Kennedy-Stroh, have all taken large orders for war materials that will require months to complete, while the outlook for more business of this kind is promising. Reports that Russia is negotiating for 300,000 to 400,000 tons of rails are receiving more credence among the trade. It is said to be the intention of the Russian Government to double-track the Trans-Siberian Railway, which is about 4000 miles in length and is now a single-track road laid with 69-lb. rails. Pig iron and steel have quieted down following the heavy sales of 10 days ago, but prices are strong. Advances in the market during the past week include \$1 per ton on forging billets, \$2 per ton on wrought-steel pipe, wrought-iron pipe and boiler tubes, and \$3 per ton on No. 28 galvanized sheets. There is more inquiry for coke, but scrap is still dragging.

Pig Iron.—W. P. Snyder & Co. report the average price on shipments of Bessemer iron in April to have been \$13.60 and on basic \$12.50, both at Valley furnace, these being the same average prices as for March. The recent sale made by W. P. Snyder & Co. for shipment to Genoa, Italy, was 16,000 tons of Bessemer iron, instead of basic, as given in our report last week. A Shenango Valley furnace interest reports a sale of 4000 tons of basic iron for July, August and September delivery at \$12.65 at furnace. The Westinghouse Machine Company has bought upward of 3000 tons of foundry iron from furnaces outside the Valley at relatively low prices, deliveries running into third quarter. It is stated that this company and the Westinghouse Electric & Mfg. Company are in the market for more pig iron. Founders in this district are busier and are taking more pig iron on their contracts than for some months. We quote: Bessemer iron, \$13.60; malleable Bessemer, \$12.75; No. 2 foundry, \$12.75 to \$13; basic, \$12.50 to

\$12.65, and gray forge, \$12.50, all at Valley furnace, with a freight rate of 95c. a ton for delivery in the Cleveland and Pittsburgh districts.

Billets and Sheet Bars.—Prices on forging billets are firm and higher, moderate sales being reported at \$26, f.o.b. mills. The obligations of the Carnegie Steel Company to its customers on billets and sheet bars are now so heavy that it cannot take any more business in open-hearth sheet bars, while some customers who have been specifying for a certain percentage of open-hearth sheet bars in their contracts will probably have to secure part of their supply from outside sources. The billet and rail sales bureau of this interest reports that its orders sent to the mills for rolling in April were about as heavy as in March, which was a record month. We quote Bessemer and open-hearth billets at \$19, and Bessemer and open-hearth sheet bars, \$19.50 to \$20, f.o.b. maker's mills, Youngstown; Bessemer and open-hearth billets, \$20, and Bessemer and open-hearth sheet bars, \$21, f.o.b. Pittsburgh. Forging billets are quoted at \$25 to \$26 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 to 0.60 carbon take \$1 per ton extra. Axle billets are quoted at \$21 to \$22.

Ferroalloys.—The recent advance of \$10 a ton, announced by English makers of ferromanganese, really cuts no figure in the market, as consumers are covered on old contracts at much lower prices, but unfortunately deliveries are not being made promptly, although large lots are stated to be on their way over. The Carnegie Steel Company occasionally sells small lots of ferromanganese for which it has obtained \$100 per ton, f.o.b. Pittsburgh. Prices on low grades of ferrosilicon are about 25c. higher this week. We quote 50 per cent. ferrosilicon in lots up to 100 tons, at \$73; over 100 tons to 600 tons, \$72; and over 600 tons, \$71, delivered in the Pittsburgh district. We quote 10 per cent. ferrosilicon at \$16.50; 11 per cent., \$17.50; 12 per cent., \$18.50, all f.o.b. cars at furnace, Ashland, Ky., Jackson or New Straitsville, Ohio, each of these points having a rate to Pittsburgh of \$2 per gross ton. We quote 20 per cent. spiegeleisen at \$25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads, 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Structural Material.—New inquiry is reported better, but it is mostly for small jobs. The McClintic-Marshall Company has taken 2000 tons for a steel furnace building for the Scovill Mfg. Company, Waterbury, Conn., and about 250 tons of bridge work for the Pennsylvania Railroad. A steel building for the Marathon Tire & Rubber Company, Cuyahoga Falls, Ohio, went to the Berger Iron Company, requiring about 600 tons of shapes, which will be supplied by the Carnegie Steel Company. We quote beams and channels up to 15-in. for May and June shipment at 1.20c., and for third quarter 1.25c., f.o.b. Pittsburgh.

Plates.—It is understood that the Pennsylvania Railroad has placed the material needed, about 22,000 tons, for the 2000 cars to be built at its shops at Altoona. The shapes and bars, about 12,000 tons, went to the Carnegie Steel Company, and the plates, about 10,000 tons, to the Cambria Steel Company. Car builders are figuring on the inquiry of the Pennsylvania Railroad for over 16,000 cars of various types, and bids are to go in not later than May 15. The International & Great Northern is inquiring for 1000 cars. It is stated that prices on plates are slightly firmer, and that several sellers who have been aggressive are now holding at 1.15c. minimum. Outside of prospective business for steel cars, the outlook for a heavy demand for plates is not very encouraging. We quote ¼-in. and heavier tank plates at 1.15c. to 1.20c. for May and June shipment, and 1.25c. for third quarter, f.o.b. Pittsburgh.

Steel Rails.—The inquiry of the Pennsylvania Railroad is for 138,000 tons of rails, 73,000 tons for the Lines East of Pittsburgh, and 65,000 tons for the Lines West. This business probably will be divided among four or five mills. The demand for light rails is active from the traction companies, but from the coal mining and

lumber interests is only fair. The Carnegie Steel Company received in the past week new orders and specifications for about 2500 tons of light rails. We quote standard section rails made of Bessemer stock at 1.25c., and of open-hearth, 1.34c., f.o.b. Pittsburgh. We quote light rails as follows, in carload lots: 8 and 10 lb. section, 1.275c.; 12 and 14 lb., 1.225c.; 16 and 20 lb., 1.175c.; 25, 30, 35, 40 and 45 lb. sections, 1.125c. The prices of light rails are materially shaded on large lots, and the rerolling mills are underselling makers of rails rolled from billets from 50c. to \$1 per ton.

Sheets.—Spelter is now quoted considerably above 13c., East St. Louis, and as a result galvanized sheets are higher and several leading makers are out of the market as sellers, having little spelter in stock. Some sheet mills are holding No. 28 galvanized sheets at 3.50c., but the American Sheet & Tin Plate Company is still quoting 3.40c., so that the market is from 3.40c. to 3.50c., Pittsburgh. Prices on Bessemer black sheets are firmer, some mills holding at 1.85c. minimum for No. 28 gauge, and blue annealed sheets are also stronger, with 1.35c. the minimum of several leading mills. The new demand for sheets is only fairly active, and specifications are moderate in volume. The American Sheet & Tin Plate Company is operating this week to 72 per cent. of its hot sheet mill capacity. We quote No. 28 Bessemer black sheets at 1.80c. to 1.85c.; No. 28 galvanized at 3.40c. to 3.50c.; Nos. 9 and 10 blue annealed sheets, 1.30c. to 1.35c.; No. 30 black plate, tin-mill sizes, H. R. & A., 1.95c.; No. 28, 1.90c.; Nos. 27, 26 and 25, 1.85c.; Nos. 22 to 24, 1.80c.; Nos. 17 to 21, 1.75c.; Nos. 15 and 16, 1.70c. The above prices are for carload lots, f.o.b. at maker's mill, jobbers charging the usual advances for small lots from store.

Tin Plate.—Specifications against contracts, especially from the can makers, have shown a material falling off, and as a result operations among the mills are not quite so active as they have been. It is believed, however, that the situation will soon show improvement, as the fruit pack is expected to be the heaviest known. Much of the tin plate for Pacific coast use this year has been shipped. Very little new business is being placed, and on small orders mills are quoting from \$3.15 to \$3.25 for 14 x 20 coke plates, depending on the desirability of the business.

Wire Rods.—The new demand is dull. Consumers are covered up to July or longer. No new foreign business has come out for some time. We quote Bessemer, open-hearth and chain rods at \$25 to \$26, f.o.b. Pittsburgh.

Carwheels.—Inquiries are in the market for a large number of cast-iron and forged steel carwheels to equip the cars to be placed by the Pennsylvania Railroad. We quote standard 33-in. freight carwheels, 6 1/4 in. rough bore, at \$15, and standard 36-in. passenger, the same bore, at \$21 per wheel, f.o.b. Pittsburgh.

Shafting.—Specifications against contracts from the machine-tool builders are active, but from the implement and automobile builders are only fairly heavy. Two leading makers continue to quote 68 per cent. off as minimum, but other makers are still naming 70 per cent. off on desirable orders. We quote cold-rolled shafting at 68 to 70 per cent. off in carload and larger lots, and 63 to 65 per cent. off in small lots, f.o.b. Pittsburgh.

Railroad Spikes.—Thus far, specifications from the railroads against contracts have been only fair, but it is believed they will soon show betterment. No new business is being placed. We quote: Standard railroad spikes, \$1.35 to \$1.40; small railroad spikes, \$1.45 to \$1.50 in carload and larger lots, f.o.b. Pittsburgh.

Hoops and Bands.—The new demand is mostly for small lots, consumers having covered their needs some time ago for delivery up to July or longer. Specifications against contracts are reported to be coming in actively. We quote steel bands at 1.20c. on new orders for second quarter shipment, and 1.25c. for third quarter, and steel hoops at 1.25c. to 1.30c. at mill.

Skelp.—While new business is light, prices are firm. Local mills are fairly well filled for the next several months. No foreign business has been offered in this

market for some time. We quote: Grooved steel skelp, 1.12 1/2c. to 1.15c.; sheared steel skelp, 1.17 1/2c. to 1.20c.; grooved iron skelp, 1.50c. to 1.55c.; sheared iron skelp, 1.60c. to 1.65c., delivered to consumers' mills in the Pittsburgh district.

Wire Products.—The wire business is showing a falling off in new demand and shipments, as it always does at this season. Specifications against contracts are coming in at a moderate rate. There is still some foreign demand for barb wire. Shipments abroad are being made continuously, mostly on contracts placed some time ago. Prices on galvanized wire products are very firm, due to the high prices ruling for spelter. To jobbers, on new orders, mills quote: Wire nails, \$1.55; galvanized nails, 1 in. and shorter, taking an advance of \$1.70 over this price, or \$3.30, and galvanized nails, 1 in. and longer, an advance of \$1.20, or \$2.80; plain annealed wire, \$1.35; galvanized barb wire and fence staples, \$2.10 to \$2.20; painted barb wire, \$1.60, all f.o.b. Pittsburgh, freight added to point of delivery, terms 30 days net, less 2 per cent. for cash in 10 days. We quote woven wire fencing at 72 per cent. off in carload lots, 71 per cent. off on 1000-rod lots and 70 per cent. on small lots, f.o.b. Pittsburgh.

Iron and Steel Bars.—The new demand for steel bars and specifications against contracts are heavy. Shipments by the Carnegie Steel Company in April were the largest in any one month for more than a year. Negotiations are on with a number of implement makers for their supply of steel bars for the last six months of this year and in some cases for the first half of 1916, but so far as known nothing has yet been closed. The new demand for steel bars for reinforcing purposes is fairly active, but with prices not so strong as some time ago. Bar-iron mills are receiving more orders and report the market firm. We quote steel bars on new orders at 1.20c. for second quarter and 1.25c. for third quarter. We quote common iron bars, made from part scrap, at 1.20c. to 1.25c., and test iron bars at 1.30c., f.o.b. Pittsburgh.

Merchant Steel.—Mills report a continued active demand for seasonable steels, and shipments in April by two of the leading makers were the heaviest in any one month for more than a year. One leading maker just outside this city is operating its plant to nearly 90 per cent. of capacity. Prices are reported firm. On small lots we quote: Iron finished tire, 1/4 x 1 1/4 in. and larger, 1.30c., base; under 1/2 x 1 1/4 in., 1.45c.; planished tire, 1.50c.; channel tire, 1/2 to 1 1/4 in., 1.80c. to 1.90c.; 1 1/4 in. and larger, 1.90c.; toe calk, 1.90c. to 2c., base; flat sleigh shoe, 1.65c.; concave and convex, 1.70c.; cutter shoe, tapered or bent, 2.20c. to 2.30c.; spring steel, 1.90c. to 2c.; machinery steel, smooth finish, 1.70c.

Cold-Rolled Strip Steel.—The new demand continues fairly heavy and makers report specifications against contracts very active. Prices are firm, small orders being placed at as high as \$2.85 base for prompt delivery. We quote hard-rolled steel, 1 1/4 in. and wider, under 0.20 carbon, sheared or natural mill edges, per 100 lb., \$2.75, delivered. Extras, which are standard among all the mills, are as follows:

Thickness, in.	Thickness	Extras for straightening and cutting to lengths not less than 24 in.	
		Extras for soft or intermediate tempers	colls only
0.100 and heavier	Base	\$0.25	\$0.10
0.099 to 0.050	0.05	0.25	0.15
0.049 to 0.035	0.20	0.25	0.15
0.034 to 0.031	0.35	0.40	0.25
0.030 to 0.025	0.45	0.40	0.40
0.024 to 0.020	0.55	0.40	0.50
0.019 to 0.017	0.85	0.50	1.10
0.016 to 0.015	1.25	0.50	1.10
0.014 to 0.013	1.95	0.50	1.25
0.012	2.30	0.50	colls only
0.011	2.65	0.50	colls only
0.010	3.00	0.50	colls only

Rivets.—New business is light, being mostly for small lots. Prices as yet show no improvement. We quote structural rivets at 1.40c., and cone-head boiler rivets at 1.50c., f.o.b. Pittsburgh. On a desirable order these prices might be shaded about \$1 per ton.

Nuts and Bolts.—Orders now coming in are mostly for small lots, as the large trade is covered by contracts placed some time ago. It is stated that the higher prices on nuts and bolts, recently announced by

several makers, are being firmly held. Discounts to the large trade are as follows:

<i>U. S. S. Cold Punched Blank and Tapped, Chambered, Trimmed and Reamed</i>	
1/2 in. and smaller hex.	8.1c. per lb. off
5/8 in. and larger hex.	7.3c. per lb. off
Square, all sizes	5.8c. per lb. off
<i>Semi-Finished Tapped</i>	
1/2 in. and smaller hex.	.85-10-10-10 off
5/8 in. and larger hex.	.85-10-10 off
<i>Black Bulk Rivets</i>	
7/16 x 6 1/2, smaller and shorter	.80-10-5 off
<i>Package Rivets 1000 Pcs.</i>	
Black, metallic tinned and tin plated	.75-10-10 off

Wrought Pipe.—Effective May 1, the makers of both merchant steel and wrought-iron pipe lowered discounts one point, equal to an advance of \$2 per ton. The Wheeling Steel & Iron Company, Wheeling, W. Va., has taken a contract for about 20 miles of 8-in., 12 miles of 12-in. and about 8 miles of 6 1/2-in. An inquiry is in the market for 30 miles of 12-in. The new discounts on pipe are given on a previous page.

Boiler Tubes.—On May 1, makers of iron and steel boiler tubes lowered discounts on less than carload lots one point, equal to an advance of \$2 per ton. The new demand for both locomotive and merchant tubes is only fair, and specifications against contracts for locomotive tubes placed some time ago at relatively low prices are not coming in very freely. The new discounts are given on a previous page.

Old Material.—The week has been very quiet, the only sales noted being between dealers, some of whom are still buying to cover short sales. It is the belief that the market is in such shape that prices may show betterment in the very near future, as the visible supply of scrap is light, while the steel mills are running to a higher rate of capacity and are using more than for some months. Sales of 1500 tons of heavy steel scrap are reported at a price slightly less than \$11.75 delivered, also 300 tons of borings at about \$8.25 and 400 tons of low phosphorus melting stock at close to \$14 delivered. For delivery in Pittsburgh and nearby districts that take Pittsburgh freights, dealers quote about as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	\$11.75
Compressed side and end sheet scrap	\$10.25 to 10.50
No. 1 foundry cast	12.00 to 12.25
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	9.25 to 9.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	11.75 to 12.00
No. 1 railroad malleable stock	10.00 to 10.25
Railroad grate bars	8.50 to 8.75
Low phosphorus melting stock	13.75 to 14.00
Iron car axles	18.75 to 19.25
Steel car axles	13.25 to 13.75
Locomotive axles, steel	19.75 to 20.25
No. 1 busheling scrap	9.75 to 10.00
No. 2 busheling scrap	7.00 to 7.25
Machine shop turnings	7.75 to 8.00
Old carwheels	10.75 to 11.00
Cast-iron borings	8.25 to 8.50
*Sheet bar crop ends	12.00 to 12.25
Old iron rails	12.75 to 13.00
No. 1 railroad wrought scrap	10.75 to 11.00
Heavy steel axle turnings	8.50 to 8.75
Heavy breakable cast scrap	10.75 to 11.00

*Shipping point.

Coke.—Two or three furnace companies are negotiating for their supply of coke for the last half, and it is expected that considerable business will be closed this month. Active inquiries now out are said to aggregate from 35,000 to 40,000 tons per month. Prices for prompt shipment are slightly lower, but there is very little demand. Not much is doing in foundry coke. The Connellsville Courier reports the output of coke in the upper and lower Connellsville regions for the week ended April 24, as 299,493 net tons, an increase over the previous week of 1271 tons. We quote standard makes of blast-furnace coke for prompt shipment from \$1.50 to \$1.60; on contracts for delivery up to July 1, \$1.65, and for delivery over all of 1915, at \$1.75. Foundry coke, standard makes, prompt, \$2 to \$2.25; contracts, \$2.15 to \$2.30.

The Pittsburgh office of the LaBelle Iron Works, Steubenville, Ohio, has been removed from room 2321 to room 1318 Oliver Building.

Chicago

CHICAGO, ILL., May 4, 1915.

Transactions pending and completed in pig iron, rails and cars are of decided importance. There is apparent none of the eagerness to close nor the marked activity of selling interests that usually characterizes a pig-iron buying movement, but a number of substantial tonnages in malleable iron and foundry grades have been placed, of which one 10,000-ton contract, two for 5000 tons and others for 3000 tons and less are typical. A campaign in Southern iron with a price of \$9.25, Birmingham, also resulted in the placing of a considerable tonnage and a subsequent advancing of the price. It is now definitely reported that the Pennsylvania Railroad will buy 138,000 tons of rails, of which 65,000 tons will be for its Lines West. There is also an aggregate of inquiry in this market for 34,000 cars, which includes 16,000 for the Pennsylvania Railroad. No relief is in sight for the makers of galvanized products, and mill quotations on galvanized sheets even exceed local store prices. Mill specifications do not improve rapidly in tonnage although the bookings of the leading interest at its Chicago mills showed a gain of over 25,000 tons for April as compared with March. There is still much improvement to be hoped for in the prices of fabricated steel and manufactured products, but, with the exception of plates, quotations for plain material are being firmly maintained. Negotiations in connection with implement bar contracts grow more animated and it is stated that trading will open on the basis of 1.20c., Pittsburgh, for six-month contracts.

Pig Iron.—In a leisurely fashion, rather unique in view of the tonnages involved, a number of the larger melters of this district have been closing for last half requirements. A manufacturer of power and pumping machinery has taken 5000 tons of foundry iron, of which 1000 tons was from the South, a contract for 10,000 tons of malleable iron and ordinary foundry grades has been made by a Chicago melter, a lot of 5000 tons of basic has been bought and a number of other sales of 2000 and 3000 tons are reported. There is an inquiry for 6000 tons of iron to be filled, partly with Northern and partly with Southern iron, while 1000 tons of high silicon iron is under consideration, if not already placed. One of the leading Southern interests has been making a canvass of this territory with a price of \$9.25, f.o.b. Birmingham, and has taken an aggregate tonnage sufficient to warrant it in advancing its price to \$10. One Federal stack, at Chicago, has just been blown in on the strength of recent bookings. Throughout this buying period the price of local iron has been maintained with considerable firmness, the largest of the tonnages placed failing to bring out any marked concessions from the price of \$13 at furnace. The foundry trade at large appears to have become more hopeful regarding the last half outlook, and the prospect now is that the greater activity of the past few weeks will be followed by a general buying in smaller tonnages. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace, and do not include a switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 2 to 5	\$15.75
Lake Superior charcoal, No. 1	16.25
Lake Superior charcoal, No. 6 and Scotch	16.75
Northern coke foundry, No. 1	\$13.50 to 13.75
Northern coke foundry, No. 2	13.00 to 13.50
Northern coke foundry, No. 3	12.50 to 13.00
Southern coke, No. 1 f'dry and 1 soft	14.00 to 14.25
Southern coke, No. 2 f'dry and 2 soft	13.50 to 14.00
Malleable Bessemer	13.00 to 13.25
Standard Bessemer	16.50
Basic	12.50 to 13.00
Low phosphorus	20.00 to 20.50
Jackson Co. and Ky. silvery, 8 per cent	16.90
Jackson Co. and Ky. silv'y, 10 per cent	17.90

Rails and Track Supplies.—Business emanating from the railroads has again attained a real importance. Not only are specifications for track fastenings and rails coming into the mills much more freely, as is normal at this season of the year, but new inquiry for rails, of which that from the Pennsylvania Railroad is the most striking, involves heavier tonnages than have been under consideration for a long time. For its Lines

West the Pennsylvania will buy 65,000 tons of rails out of a total of 138,000 tons, the Rock Island is to buy 10,000 tons at once, while other lots of similar tonnage are under consideration. We quote standard railroad spikes at 1.45c. to 1.50c., base; track bolts with square nuts, 1.90c., base, all in carload lots, Chicago; tie plates, \$23.25 to \$24.25, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base; open-hearth, 1.34c.; light rails, 25 to 45 lb., 1.07c.; 16 to 20 lb., 1.12c.; 12 lb., 1.17c.; 8 lb., 1.22c.; angle bars, 1.50c., Chicago.

Structural Material.—There is at present inquiry for 34,000 cars in this market, including one lot of 16,000, another of 8000, a third of 5000, 2000 for the Milwaukee and 3000 for the Northwestern, of which 2000 are already understood to have been placed. An estimate of the steel required for this equipment places the minimum at 200,000 tons. The tonnage of building steel let by the Anaconda Copper Mining Company, as mentioned in this report a week ago, was divided, 3108 tons going to the Minneapolis Steel & Machinery Company and 1407 tons to the Worden-Allen Company for fabrication by the Lackawanna Bridge Company. A number of other contracts, totaling about 900 tons, are also noted as placed. Prices for fabricated steel in this market continue to bear but little relation to the cost of manufacture, a very low level having been reached. Tenders for bascule bridges at East Chicago and Crown Point, Ind., will be received May 14, by Edward Simon, county auditor. For new business, quotations on plain material appear to be well maintained at 1.20c., Pittsburgh, and we quote for Chicago delivery from mill 1.389c.

The movement of structural material out of store is still much hampered by the tie-up in the local building trade. We quote for Chicago delivery from jobbers' stock 1.75c.

Plates.—The ruling price for plates, which is \$2 a ton below the level of structural and bar prices, is sufficient evidence of the eagerness of plate mills for this kind of business. Mill operations in this territory are entirely from hand to mouth, and tonnage on the books is scarcely more than a day or two ahead of the actual rolling. We quote for Chicago delivery of plates from mill 1.289c.

We quote for Chicago delivery of plates out of stock 1.75c.

Sheets.—The steady rise in the price of spelter has placed most of the mills in a situation where they are unable to sell galvanized sheets at prices less than 4c., Pittsburgh, although there are still outstanding some quotations as low as 3.75c. Some of the mills which have been making up black-sheet stock for future galvanizing, in anticipation of an early improvement in the situation, are now facing a heavy accumulation and a shutdown of their mills. There has been a fair activity, locally, in the heavier gauges of sheets, the Pullman Company being an important buyer for street car work. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.489c.; No. 28 black, 1.939c.; No. 28 galvanized, 3.439c. to 3.589c.

The price of galvanized sheets out of local stock compares so advantageously with mill prices, under the present situation, that there has been a noticeable increase in the tonnage moving out of store, and this promises to be felt increasingly. We quote for Chicago delivery from jobbers' stocks as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.55c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—Of most interest in connection with the steel-bar situation are the developments tending toward the placing of implement contracts. The disposition of the mills to limit these contracts to a six months' period with an advance for the last six months grows more pronounced. The indications are that 1.20c., Pittsburgh, will be the open basis for contracting, with a probable concession of \$1 a ton to the larger buyers. Current specifications for steel bars have not been uniformly good with all of the mills, although one interest reports its merchant mill operation at 85 per cent. Bar-iron tonnage is noticeably scarce. We quote for mill shipments as follows: Bar iron, 1.15c.; soft steel bars, 1.389c.; hard steel bars, 1.20c.; shafting, in carloads, 65 to 68 per cent. off; less than carloads, 60 to 65 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes $1\frac{1}{2}$ in. and over and usual card extras for smaller sizes; shafting 60 per cent. off, and in carloads, 62 per cent. off.

Rivets and Bolts.—There is some new inquiry for bolts and the situation is opening up preparatory to contracting by the manufacturers of agricultural implements. Prices are being held steadily. Rivet sales are light and prices are subject to varying concessions. Quotations are as follows: Carriage bolts up to $\frac{3}{8}$ x 6 in., rolled thread, 80-15; cut thread, 80-10; larger sizes, 75-17 $\frac{1}{2}$; machine bolts up to $\frac{3}{8}$ x 4 in., rolled thread, 80-20; cut thread, 80-15; larger sizes, 80-2 $\frac{1}{2}$; coach screws, 85-2 $\frac{1}{2}$; hot pressed nuts, square, \$6.60 to \$6.40 off per cwt.; hexagon, \$7.60 to \$7.30 off per cwt. Structural rivets, $\frac{3}{8}$ to 1 $\frac{1}{4}$ in., 1.50c. to 1.55c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 2c.; boiler rivets, 2.10c.; machine bolts up to $\frac{3}{8}$ x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to $\frac{3}{8}$ x 6 in., 75-10; larger sizes, 70-15 off, hot pressed nuts, square, \$6, and hexagon, \$6.70 off per cwt.

Wire Products.—The volume of trade has tapered off, less noticeably with respect to wire nails than most of the other products. On wire nails concessions of \$1 a ton from the 1.60c., Pittsburgh, basis are generally reported. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, \$1.589; wire nails, \$1.739 to \$1.789; painted barb wire, \$1.789; galvanized barb wire, \$2.289 to \$2.389; polished staples, \$1.789; galvanized staples, \$2.289 to \$2.389, all Chicago.

Cast-Iron Pipe.—At Cincinnati, Ohio, the low bidder on 3400 tons was the United States Cast Iron Pipe & Foundry Company, this being the only sizeable lot placed last week. Bids were taken on 475 tons at Springfield, Ill., and figures are to be asked at Detroit on 500 tons for the fire commissioners, and 600 tons for Highland Park. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$25.50; 6 to 12 in., \$23.50; 16 in. and up, \$23, with \$1 extra for gas pipe.

Old Material.—There has been comparatively little trading in scrap but such transactions as have been reported show a tendency toward a firmer attitude on the part of sellers. This firmness has not been of sufficient degree to be represented by higher quotations, although some small advances have been secured within the spread of our prices. There is being offered on current railroad lists an aggregate of scrap approaching 20,000 tons; part of this, however, submitted by the Pennsylvania Lines, will be diverted to other markets. The Chicago & Northwestern list is 5500 tons, including 1000 tons of No. 1 wrought and 1000 tons of steel rails; the Chicago & Alton, 1100 tons; the Wabash, 2200 tons; the Soo Line, 600 tons, and the Vandalia, 600 tons. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton
Old iron rails	\$11.75 to \$12.25
Old steel rails, rerolling	10.25 to 10.75
Old steel rails, less than 3 ft.	10.00 to 10.50
Old carwheels	9.75 to 10.00
Heavy melting steel scrap	9.25 to 9.50
Frogs, switches and guards, cut apart	9.25 to 9.50
Shoveling steel	8.75 to 9.00
Steel axle turnings	7.00 to 7.25

	Per Net Ton
Iron angles and splice bars	\$11.50 to \$12.00
Iron arch bars and transoms	11.75 to 12.25
Steel angle bars	8.50 to 8.75
Iron car axles	13.50 to 13.75
Steel car axles	10.50 to 11.00
No. 1 railroad wrought	8.75 to 9.00
No. 2 railroad wrought	8.25 to 8.75
Cut forge	8.25 to 8.75
Steel knuckles and couplers	8.00 to 8.50
Steel springs	8.75 to 9.25
Locomotive tires, smooth	8.50 to 9.00
Machine shop turnings	5.00 to 5.25
Cast borings	5.00 to 5.50
No. 1 busheling	7.25 to 7.75
No. 2 busheling	6.25 to 6.75
No. 1 boilers, cut to sheets and rings	5.50 to 6.00
Boiler punchings	8.25 to 8.50
No. 1 cast scrap	9.00 to 9.25
Stove plate and light cast scrap	7.75 to 8.00
Grate bars	7.50 to 7.75
Railroad malleable	8.00 to 8.25
Agricultural malleable	7.25 to 7.50
Pipes and flues	6.50 to 6.75

Henry Drier, trustee in bankruptcy of the Shimer Steel & Wire Company, Evansville, Ind., announces that the property will soon be offered for sale.

Philadelphia

PHILADELPHIA, PA., May 4, 1915.

While mill and foundry operations have not increased to any considerable extent, the statement is so universally made that conditions are better than the same conclusion can be safely applied to the market as a whole. In the finished steel line the chief item has been the placing of orders for 4000 to 8000 tons of shapes and bars and 5000 to 10,000 tons of plates by the Pennsylvania Railroad for the cars it will build in its own shops. The business was divided. Orders from the same railroad for axles and forgings are under consideration. Inquiries generally are not large but there are a goodly number of them. For plates, shapes and bars 1.359c., Philadelphia, is quite generally quoted for this quarter, though some weakness is shown by plates and the local market for structural material has not been tested by any business of magnitude. Further inquiry for shrapnel rounds is being figured on. Sheets are moving better. Pig iron has shown some irregularity so far as sales in this district go. Prices have been advanced by one maker of Virginia iron and another maker of Southern iron, but the movement is not a common one and sales have been made at the old prices. The quotation for ferromanganese has been advanced \$10 per ton, but the stringency will soon be relieved according to the present outlook. Heavy melting steel is firm but there is not much more activity.

Iron Ore.—The market in foreign ore continues lifeless. Arrivals of the week ended May 1 totaled 14,089 tons from Sweden.

Pig Iron.—The pig-iron trade is taking a more hopeful view of conditions, although it must be admitted that the past week was quieter than the preceding one. There were a few good sales but not enough to go round. The greater part of the business has been in small lots, and the inquiries out indicate a continuance of the same kind of business. A prominent seller disposed of only 1000 tons in the week. Small lot deliveries are being made at a good rate, and in some cases consumers are insistent on the promptness of such deliveries, indicating that they are carrying but little stock. An enameling company in Baltimore is reported to have purchased about 4000 tons of Southern iron and 1000 tons of eastern Pennsylvania iron for last half delivery. A local pipe works took about 6000 tons of low grade iron, believed to have been Southern, though details are lacking. Pipe makers generally are showing more interest, and heavier buying on their part may come any day. One maker of Southern iron represented here has advanced his price to \$10, Birmingham, for No. 2. He declined to sell 1000 tons of this grade at \$9.50 and also let an order for a few thousand tons of low grade iron go by because of price. A maker of Virginia iron has advanced his price for No. 2 X to \$13 and for No. 2 plain to \$12.50, furnace. Other Virginia producers have not followed. One of them sold more iron last month than in any previous month in the past two years, yet his shipments of last month were less than the preceding months. This particular maker holds that it is shipments and not contracts that count. It is believed that much of the recent buying has been on speculative account. Some negotiations for basic are under way, but no further sales are reported. About 1500 tons of Lebanon low phosphorus was taken in the week, also a few hundred tons of standard low phosphorus. Quotations for standard brands for early delivery in buyers' yards in this district are as follows:

Eastern Penna. No. 2 X, foundry	... \$14.25 to \$14.50
Eastern Penna. No. 2 plain	14.00 to 14.25
Virginia, No. 2 X, foundry	15.25
Virginia No. 2 plain	15.00
Gray forge	13.25 to 13.50
Basic	13.25 to 13.50
Standard low phosphorus	20.00 to 20.50

Ferroalloys.—Representatives of English producers have advanced their quotation for 80 per cent. ferromanganese from \$78 to \$88, seaboard. In the past few days about 2000 tons have arrived at Philadelphia, Baltimore and New Orleans, and with the prospect of still larger arrivals at an early day the tight situation

promises to be relieved. At the new price no seller will agree to make large prompt shipments, but will take business which is spread out throughout the year. The local customs house reports that 219 tons arrived here last week. Quotations for 50 per cent. ferrosilicon are \$71 to \$73, Pittsburgh, according to quantity.

Bars.—Makers are holding to 1.20c., Pittsburgh, or 1.359c., Philadelphia, for steel bars, delivery this quarter, and \$1 per ton more for delivery in the third quarter. The demand has been better though no noteworthy individual orders are mentioned. The agricultural implement makers are buying, but their purchases are in some cases being restricted to January 1 instead of for the full year. The Pennsylvania Railroad has taken bars, along with plates and shapes. In iron bars there has been more activity and 1.17½c. to 1.20c., Philadelphia, is quoted.

Plates.—Two tank steamships, one 440 ft. long and another 410 ft. long, have been placed with the Harlan & Hollingsworth Corporation. The vessels are for the Anglo-Saxon Petroleum Company and the Mexican Petroleum Company. Including these contracts the corporation has two years' work for its yards. Miscellaneous orders continue to contribute the bulk of the business in plates and they have been coming along in good volume. The Pennsylvania Railroad was the principal individual purchaser. While some makers say their price is firm at 1.359c., Philadelphia, others do not seek to disguise the fact that they will accept 1.309c. on prompt shipments.

Rails.—An order for 1000 tons has been placed with the Maryland Steel Company by the Havana Central Railroad. As was stated a week ago, the Pennsylvania Railroad has revived inquiries on its 1915 rail requirements and the trade now has them in hand. The inquiry went to the Algoma Steel Corporation, Ltd., Sault Ste. Marie, Canada, as well as to American mills.

Structural Material.—Except for a fair number of small propositions the market is quiet hereabout. The Pennsylvania Steel Company will supply 2000 tons required by a factory building for the Remington Arms Company, Bridgeport, Conn. Bids are being asked for the material required by an eight-story automobile garage to be erected on Broad street, this city, for the Gomory-Schwartz Motor Car Company. A couple of hotel propositions are hanging fire in Baltimore. Bids went in yesterday on 200 tons for the plant extension of the Hickok Mfg. Company, Harrisburg, Pa. April was a better month than March with local mills, but these are running mostly on old commitments and the price on new business is more or less uncertain. The quotation, however, is 1.359c., Philadelphia, for this quarter.

Sheets.—The demand for sheets is steady and local mills are running full, which they are able to do as a result of business from the West, especially from makers of automobiles. The stove makers are beginning to come into the market stronger. Quotations are unchanged at 1.459c. to 1.509c., Philadelphia, for No. 10 blue annealed.

Billets.—The market is steady at \$22.02, Philadelphia, for open-hearth rolling billets, with an additional charge of \$4 to \$5 for forging steel. Export inquiries continue to come along but the scarcity of space in transatlantic vessels is a detriment to foreign business.

Coke.—In foundry coke there is a little more activity, and on forward shipments \$2.60 at Latrobe oven has been paid. This is equal to \$2.40, Connellsville. As a rule, however, lower prices are quoted. They range as follows for Connellsville coke. Prompt furnace, \$1.55 to \$1.65; contract furnace to January 1, \$1.75; prompt foundry, \$2 to \$2.35, and contract foundry, \$2.20 to \$2.35, all prices being per net ton at oven. Freight rates from the principal producing districts are as follows: Connellsville, \$2.05; Latrobe, \$1.85, and Mountain, \$1.65.

Old Material.—The demand for scrap is not brisk, but it is better in reflection of the busier operations at the steel mills. This is true particularly of heavy melting steel, some moderate-sized lots of which have

sold at \$11.50. Consumers, however, are disinclined to pay over \$11.25. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to \$1.35 per gross ton, are as follows:

No. 1 heavy melting steel	\$11.00 to \$11.50
Old steel rails, rerolling	11.50 to 12.00
Low phos. heavy melting steel scrap	14.25 to 14.50
Old steel axles	14.00 to 14.50
Old iron axles	17.50 to 18.00
Old iron rails	14.50 to 15.00
Old carwheels	11.00 to 11.50
No. 1 railroad wrought	12.75 to 13.25
Wrought-iron pipe	10.25 to 10.50
No. 1 forge fire	8.00 to 8.50
Bundled sheets	9.00 to 9.50
No. 2 busheling	7.75 to 8.25
Machine shop turnings	8.25 to 8.75
Cast borings	8.00 to 8.25
No. 1 cast	11.75 to 12.25
Grate bars, railroad	9.00 to 9.25
Stove plate	9.00 to 9.25
Railroad malleable	9.50 to 10.00

Cincinnati

CINCINNATI, OHIO, May 5, 1915.—(By Wire.)

Pig Iron.—A general advance in Southern iron prices has been attempted, and it has been successful in individual cases as far as future shipment business is concerned. While \$9.50, Birmingham basis, can still be done for May and June shipment the majority of furnaces are holding out for \$9.75 for the third quarter and \$10 for the last quarter. No business is reported at the last-named figure, but quite a number of small contracts have been made on a basis of \$9.75. Among these is a 500-ton sale to a local melter for July-September delivery. Another local foundry bought 300 tons for the same shipment. The occasion for the advance in Southern iron appears to be the booking of large tonnages for export and to leading consumers, and also important sales of Southern basic for last half shipment. It is also reported that speculative buying was an influencing factor in the situation. Northern foundry iron is unchanged, with No. 2 foundry obtainable for prompt shipment at \$12.50, Ironton, although only a few unimportant sales are reported. An Ohio melter is inquiring for 2000 tons of Northern iron for the last half and will probably close before the week has ended. Other smaller inquiries are reported from central Ohio, but the lower delivered prices on Southern iron at many points puts the Northern producer at a disadvantage. A number of inquiries for malleable have been received from other districts, but no large sales are reported. The Ohio silvery irons are not firm at present quotations, and sales have been made for near-by shipment as low as \$14.50 at furnace. Based on freight rates of \$2.90 from Birmingham and \$1.26 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	\$12.90 to \$13.40
Southern coke, No. 2 f'dry and 2 soft	12.40 to 12.90
Southern coke, No. 3 foundry	11.90 to 12.40
Southern No. 4 foundry	11.40 to 11.90
Southern gray forge	10.90 to 11.40
Ohio silvery, 8 per cent. silicon	16.01 to 16.26
Southern Ohio coke, No. 1	14.76 to 15.26
Southern Ohio coke, No. 2	13.76 to 14.26
Southern Ohio coke, No. 3	13.51 to 13.76
Southern Ohio malleable Bessemer	14.01
Basic, Northern	14.01
Lake Superior charcoal	15.25 to 17.25
Standard Southern carwheel	26.90 to 27.40

(By Mail)

Coke.—The demand for both furnace and foundry coke is light, although foundrymen are expected to come in the market shortly for last half requirements. We continue to quote 48-hr. Connellsville coke at \$1.50 to \$1.60 per net ton at oven, with 10c. to 15c. a ton added for contract business. Prompt foundry coke ranges from \$2.10 to \$2.40, with the last-named figure representing the average asking price for future shipments. A few Connellsville producers are firm at \$2.50 for last half. Wise County and Pocahontas operators report slack business, but shipments on old contracts are moving satisfactorily.

Finished Material.—The improved demand for galvanized sheets, especially noticeable from the South, is very gratifying. The recent sensational advances in spelter have created a rather disturbed condition as far as future shipment quotations are concerned. One mill in this territory is quoting 3.60c., Pittsburgh basis, for

No. 28 galvanized sheets, for future shipment. From 3.40c. to 3.50c., Pittsburgh, represents the prompt shipment price. Black sheets, No. 28, are held at 1.80c. to 1.85c., Pittsburgh, but very little business is reported. Some improvement is noted by mill agencies making a specialty of steel bars and small structural shapes, and there is considerable business in sight. We quote steel bars from local warehouse stocks around 1.75c. to 1.80c. and small structural shapes about 5c. per 100 lb. higher. Tool and forging steel salesmen all report a very active business, most of which comes from machine-tool manufacturers.

Old Material.—A considerable quantity of No. 1 machine cast scrap was sold in this territory last week. There was also a better demand from the rolling mills for different grades. Prices remain unchanged and the large railroad offerings will doubtless tend to keep them at the same level for some time. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards.

Per Gross Ton		
Bundled sheet scrap	\$6.25 to	\$6.75
Old iron rails	10.50 to	11.50
Relaying rails, 50 lb. and up	19.25 to	19.75
Rerolling steel rails	9.75 to	10.25
Melting steel rails	8.50 to	9.00
Heavy melting steel scrap	8.50 to	9.00

Per Net Ton		
No. 1 railroad wrought	\$8.50 to	\$9.00
Cast borings	4.50 to	5.00
Steel turnings	4.50 to	5.00
Railroad cast scrap	9.00 to	9.50
No. 1 machinery cast scrap	10.25 to	10.75
Burnt scrap	6.50 to	7.00
Old iron axles	13.50 to	14.00
Locomotive tires (smooth inside)	8.50 to	9.00
Pipes and flues	5.75 to	6.25
Malleable and steel scrap	7.00 to	7.50
Railroad tank and sheet scrap	5.00 to	5.50

The Ashland Iron & Mining Company, Ashland, Ky., announces the appointment of Eaton, Rhodes & Co., Cincinnati and Pittsburgh, as exclusive sales agents for Ashland and Boyd foundry and malleable basic pig iron. The head offices of Eaton, Rhodes & Co. are located in the First National Bank Building, Cincinnati.

Buffalo

BUFFALO, N. Y., May 4, 1915.

Pig Iron.—This market has been comparatively quiet, with light inquiry and only a small total of business booked. Most of the producers of the district claim to be holding to a \$13 minimum for the principal grades, but some are reported as having quoted under this basis in some instances. Charcoal iron is still in active demand. The following quotations represent the market as accurately as possible for current and last half delivery, f.o.b. furnace:

No. 1 foundry	\$13.25 to \$13.50
No. 2 X foundry	13.00 to 13.25
No. 2 plain	12.75 to 13.00
No. 3 foundry	12.50 to 12.75
Gray forge	12.50
Malleable	13.00 to 13.25
Basic	13.25 to 13.75
Charcoal, regular grades and analysis	15.75 to 17.25
Charcoal, special grades and analysis	19.00 to 20.00

Finished Iron and Steel.—Specifications on contracts and new business have both been of good volume for the week, and users are pushing hard for quick shipments, particularly for structural material, bars and wire products, most wire mills being from 30 to 60 days behind on deliveries. Wire mill deliveries appear to be falling further behind daily, and bar and plate mills are also finding it difficult in some instances to make deliveries as quickly as asked for by customers. Bids are to be received May 18 for construction of the city dock at Dunkirk, N. Y., which will require a considerable quantity of steel for drift bolts, screw bolts, boat spikes, etc. The Lackawanna Bridge Company, Buffalo, has secured the contract for steel work for the new smelter to be erected at Great Falls, Montana, by the Anaconda Mining Company, about 3000 tons.

Old Material.—The market exhibits greater activity than for some time and better prices are obtainable for a number of commodities. Several large sales of heavy melting steel are reported, also of machine-shop turn-

ings, cast borings, busheling scrap and bundled sheet scrap. Considerable inquiry for old carwheels is noted from Canadian sources and a sale of about 400 tons for Canadian delivery was made at \$11.15, Buffalo. Cast scrap and malleable scrap are quiet. We quote dealers asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	\$10.50 to \$11.00
Low phosphorus steel	13.00 to 13.50
No. 1 railroad wrought scrap	10.00 to 10.50
No. 1 railroad and machinery cast	10.50 to 11.00
Old steel axles	12.00 to 12.50
Old iron axles	16.00 to 16.50
Old carwheels	10.75 to 11.25
Railroad malleable	9.50 to 10.00
Machine shop turnings	5.75 to 6.25
Heavy axle turnings	8.50 to 9.00
Clean cast borings	6.50 to 6.75
Old iron rails	11.00 to 11.50
Locomotive grate bars	9.00 to 9.50
Stove plate (net ton)	8.25 to 8.75
Wrought pipe	7.00 to 7.50
Bundled sheet scrap	7.25 to 7.75
No. 1 busheling scrap	8.50 to 9.00
No. 2 busheling scrap	6.50 to 7.00
Bundled tin scrap	9.00

Cleveland

CLEVELAND, OHIO, May 4, 1915.

Iron Ore.—The Pittsburgh Steel Company is reported to have purchased a round lot of non-Bessemer ore and several small lot sales have been made to independent interests. Quite a number of smaller sized inquiries are pending and the outlook in the trade is regarded as quite satisfactory. Some of the leading shippers announce that they will give the buyers the advantage of the 5c. a ton reduction in freight rates, made on Mesaba ore by the Interstate Commerce Commission, effective June 15. Contracts will be so written, however, that the sellers will be protected, should the railroads attempt to offset this loss in revenue by putting on a 5c. dockage charge. Ore shipments during April show a good gain over the corresponding month a year ago, amounting to 503,832 gross tons, as compared with 269,686 tons in April, 1914, and 866,387 tons in April, 1913. We quote prices as follows delivered to lower Lake ports; Old Range Bessemer, \$3.75; Mesaba Bessemer, \$3.50; Old Range non-Bessemer, \$3; Mesaba non-Bessemer, \$2.85.

Pig Iron.—Following the activity in steel-making iron reported last week the market shows little life. The Central Steel Company, Massillon, Ohio, has purchased about 3500 tons of basic to cover its requirements for the first two or three months of its operation. Some foundry iron contracts for small lots are coming out. While \$12.50 at furnace is generally the minimum quotation of Lake and Valley furnaces for No. 2 foundry, this price has been shaded about 25c. by a Cleveland seller on an inquiry from a competitive point. Southern iron is firmer. Some of the producers have advanced their prices to \$10, Birmingham, for No. 2 for the last half, and while Southern spot iron can still be had at \$9.50, there appears to be little, if any, iron left at this price for the last half. We quote, delivered Cleveland, as follows:

Bessemer	\$14.55
Basic	13.45
Northern No. 2 foundry	\$13.25 to 13.50
Southern No. 2 foundry	13.50 to 14.00
Gray forge	13.00
Jackson Co. silvery 8 per cent. silicon	16.37 to 16.62
Standard low phos. at furnace	19.75 to 20.00

Coke.—Two leading producers have announced foundry coke prices for the last half and for twelve months from July 1, one make being quoted at \$2.40 and the other at \$2.50 per net ton at oven. A number of consumers have placed contracts at these prices. We quote standard foundry coke for prompt shipment at \$2.25. Furnace coke is inactive. We quote furnace coke at \$1.45 to \$1.55 per net ton at oven for spot shipment and \$1.65 to \$1.75 for contracts.

Finished Iron and Steel.—Specifications on contracts are very good and mill agencies report considerable contracting for steel bars, plates and structural material for the third quarter delivery at 1.25c., Pittsburgh. For May and June delivery the market on steel bars and structural material is firm at 1.20c. and plates are well maintained at 1.15c. to 1.20c. Inquiries for steel for specific work, including buildings, are rather

light. The Riverside Bridge Company, Wheeling, W. Va., has taken 400 tons for a building for the Falls Rubber Company, Cuyahoga Falls, Ohio, and the Mt. Vernon Bridge Company has taken 1300 tons for Baltimore & Ohio bridge work in Chicago. The F. W. Mark Construction Company, Cleveland, has taken a warehouse for the Fisher Brothers, Cleveland, and will place a fabricating contract for 300 tons of steel. The pontoon crane for the Norfolk Navy Yard, awarded the Wellman-Seaver-Morgan Company, will require about 600 tons of steel. The Buick Motor Company will erect a new building in Cleveland that will require 300 tons reinforcing bars. The demand for sheets is somewhat lighter than it has been. Some of the makers of galvanized sheets have used up their stock of low priced spelter and are not quoting prices on galvanized sheets. We quote black sheets at 1.75c. to 1.80c. for No. 28, galvanized at 3.30c. to 3.60c. for No. 28, and blue annealed at 1.30c. to 1.35c., Ohio mill. The demand for spikes has improved. Some small lot sales are reported at 1.40c. and an inquiry for 1600 kegs is pending. Bar iron is in light demand. Price quotations for delivery in this territory are 1.10c. Pittsburgh and 1.13½c., Chicago. Warehouse prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

Bolts, Nuts and Rivets.—Some of the leading bolt and nut makers report the volume of their April business larger than in any month during the past year. Specifications are coming out in good volume from nearly all sources except the railroads. Local plants are being operated at about 80 per cent. capacity. Prices are firm. Rivets are quiet with prices unchanged at 1.40c. to 1.45c., Pittsburgh, for structural and 1.50c. to 1.55c. for boiler rivets. Bolt and nut discounts are as follows: Common carriage bolts, 3/8 x 6 in., smaller or shorter, rolled thread, 80 and 15 per cent.; cut thread, 80 and 10 per cent.; larger or longer, 75 and 17½ per cent.; machine bolts with h.p. nuts, 3/8 x 4 in., smaller or shorter, rolled thread, 80 and 20 per cent.; cut thread, 80 and 15 per cent.; larger or longer, 80 and 2½ per cent.; coach and lag screws, 85 and 2½ per cent.; square h.p. nuts, blank or tapped, \$6.40 off; hexagon h.p. nuts, blank or tapped, \$7.30 off; c.p.c. and t. square nuts, blank or tapped, \$6.10 off; hexagon, 5/8 in., and larger, \$7.60 off; 9/16 and smaller, \$8.30 off; semi-finished hexagon nuts, 5/8 in. and larger, 85, 10, 10 and 5 per cent.; 9/16 and smaller, 85, 10, 10, 10 and 5 per cent.

Old Materials.—The market is unsettled and not active. Mills are able to pick up small lots at low prices. The local consumption has improved, but scrap has been coming in faster than wanted, and an embargo has been declared on shipments to the Upson Nut Company. A Cleveland mill has purchased some heavy melting steel at \$10.25 to \$10.50. Some activity in borings and turnings is reported in Youngstown and Brackenridge. For Youngstown delivery we quote heavy steel at \$11.25 to \$11.50; borings at \$8.50 and turnings at \$7.75. Local prices are unchanged. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Old steel rails, rerolling	\$11.00 to \$11.75
Old iron rails	12.00
Steel car axles	12.00 to 12.50
Heavy melting steel	10.25 to 10.50
Old carwheels	9.75 to 10.00
Relaying rails, 50 lb. and over	22.50
Agricultural malleable	8.00 to 8.50
Railroad malleable	10.00 to 10.25
Steel axle turnings	8.75 to 9.00
Light bundled sheet scrap	8.00 to 8.50

Per Net Ton	
Iron car axles	\$15.00 to \$15.50
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	5.50 to 5.75
No. 1 busheling new	8.50 to 8.75
No. 1 busheling old	8.25 to 8.50
No. 1 railroad wrought	9.50 to 9.75
No. 1 cast	9.75 to 10.25
Stove plate	7.75 to 8.00

The George H. Smith Steel Casting Company, Milwaukee, has removed its Chicago office, in charge of J. B. Marshall, from the First National Bank Building to 1657 Conway Building.

Birmingham

BIRMINGHAM, ALA., May 3, 1915.

Pig Iron.—The optimism created by the sale of 200,000 tons of pig iron in the first three weeks of April has been accentuated by reliable data for the entire month, which show total sales of over 300,000 tons, the withdrawal from the market of one concern and the advance to a \$10 basis on the part of practically all makers. The larger portion of the April orders, even in the latter part of the month, were booked on the \$9.50 basis, while much of it was sold in the first two weeks under \$9.50. The buying was participated in by all sorts of interests, with the pipe people leading. Sales were in as large lots as 25,000 tons in one or two instances, one of the latest of these being on a basis of \$9.50 for the remainder of the year. One maker of pig iron, whose product always brings the highest market price, sold one round lot of No. 2 for delivery over the remainder of the year at \$10, but other makers do not profess to have made April sales at that figure. One company booked an aggregate of 20,000 tons on the \$9.75 basis. It is known that a maker with two active stacks sold over 100,000 tons; another, similarly situated, sold 80,000 tons; another is credited in the best-informed circles with sales of 100,000 tons, while the leading interest has doubtless booked at least 75,000 tons. The two smallest producers probably booked 25,000 tons between them. These figures appear stupendous, but they are reliable. A prominent manufacturer says he looks for \$11 iron before it is over. The market in the last few days of April was flooded with offers by consumers of \$9.50 and \$9.75 for round lots that were turned down. The Alice furnace of the Tennessee Company is being made ready for operation and a Bessemer stack is being relined. The Woodward Iron Company will light the fires in Vanderbilt furnace as soon as its additional by-product ovens are completed. Probably another stack at Ensley will be put in. However, there seems no haste to increase output until furnace stocks have further dwindled. We quote, per gross ton, f.o.b. Birmingham district furnaces, as the probable minimum for preferred customers and the last half basis, as follows:

No. 1 foundry and soft	\$10.25 to \$10.50
No. 2 foundry and soft	9.75 to 10.00
No. 3 foundry	9.25 to 9.50
No. 4 foundry	9.00 to 9.25
Gray forge	8.75 to 9.00
Basic	9.75 to 10.00
Charcoal	22.50 to 23.00

Cast-Iron Pipe.—The water pipe concerns, in view of the good business now being done and the steadiness of the demand, have made large purchases of pig iron. Orders are coming from all over the country, with the Northwest leading. A large Cuban order was landed through an outside broker and it is not known here who got the contract. Five to six cars of sanitary pipe represent an order recently obtained from a point in South America. The makers of sanitary pipe are much encouraged over the seasonable improvement in the demand. Prices are strongly maintained. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., \$20; 6-in. and upward, \$18, with \$1 added for gas pipe. For second half delivery 50c. per ton more is demanded.

Coal and Coke.—Some improvement in the steam coal market is noted, owing to an increase in consumption by the railroads, but otherwise there has been no change. The demand for the available supply of coke is sufficient to take care of it. Prices have not changed. We quote per net ton, f.o.b. oven, as follows: Furnace coke, \$2.75 to \$2.90; foundry, \$3 to \$3.25.

Old Material.—The market shows signs of rejuvenation that lead to trust in a considerable betterment in the near future. Prices are maintained with more regularity. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles	\$13.00 to \$13.50
Old steel axles	12.50 to 13.00
Old iron rails	12.50 to 12.50
No. 1 railroad wrought	8.50 to 9.00
No. 2 railroad wrought	7.50 to 8.00
No. 1 country wrought	8.00 to 8.50
No. 1 machinery cast	8.25 to 8.50
No. 1 steel scrap	8.00 to 8.25
Tram carwheels	8.25 to 8.50
Stove plate	7.00 to 7.50

St. Louis

ST. LOUIS, Mo., May 3, 1915.

Pig Iron.—Quite a buying movement started the past week, the first real evidence in some time of active interest among consumers. The sales for the week totaled about 5000 tons, running from carloads up to one transaction involving 1000 tons. Inquiries pending include one for 500 tons of No. 2 Southern, one for 500 to 1000 tons of No. 3 Southern and several smaller lots. Prices are more firmly held.

Coke.—There is no activity so far as new business is concerned. By-product coke is quoted at about \$5.10 per net ton, delivered, St. Louis.

Finished Iron and Steel.—There is more inclination on the part of fabricators to consider contracts ahead. Bars are in more active demand than structural material. Agricultural and vehicle concerns are taking bars a little more freely. Railroad interests are still out of the market, but the activity of relayers in the old material market is expected to lead to a willingness on the part of some of the roads to do some replacement work and so lead to purchases of standard section rails. Track fastenings are fairly active. Tank plates are quiet. Movement out of warehouse continues very good and prices for stock are thus quoted: Soft steel bars, 1.70c.; iron bars, 1.65c.; tank plates, 1.80c.; structural material, 1.80c.; No. 10 blue annealed sheets, 2c.; No. 28 black sheets, cold rolled, one pass, 2.55c.; No. 28 galvanized sheets, black sheet gauge, 3.75c.

Old Material.—While there is some increase of interest among the dealers as a result of a little trading among themselves to meet some immediate and special requirements of customers, there has been little change in the general market and no improvement in prices, but rather the reverse, according to the best reports. Consumers are still maintaining, practically, an embargo. Lists out for the week include 800 tons from the Missouri Pacific, 2200 tons from the Wabash, 500 tons from the Vandalia and 14,000 tons from the Baltimore & Ohio. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton	
Old iron rails	\$10.25 to \$10.75
Old steel rails, re-rolling	9.75 to 10.25
Old steel rails, less than 3 feet	10.75 to 11.25
Relaying rails, standard section, subject to inspection	22.00 to 23.00
Old carwheels	9.00 to 9.50
No. 1 railroad heavy melting steel scrap	9.00 to 9.50
Shoveling steel	8.25 to 8.75
Frogs, switches and guards cut apart	9.00 to 9.50
Bundled sheet scrap	5.75 to 6.00
Per Net Ton	
Iron angle bars	\$10.25 to \$10.75
Steel angle bars	8.00 to 8.50
Iron car axles	13.75 to 14.25
Steel car axles	10.00 to 10.50
Wrought arch bars and transoms	11.00 to 11.50
No. 1 railroad wrought	7.75 to 8.25
No. 2 railroad wrought	7.75 to 8.25
Railroad springs	8.00 to 8.50
Steel couplers and knuckles	8.00 to 8.50
Locomotive tires, 42 in. and over, smooth inside	8.75 to 9.25
No. 1 dealers' forge	7.00 to 7.50
Mixed borings	4.75 to 5.25
No. 1 busheling	7.25 to 7.75
No. 1 boilers, cut to sheets and rings	6.00 to 6.50
No. 1 railroad cast scrap	8.00 to 8.50
Stove plate and light cast scrap	6.50 to 7.00
Railhead malleable	6.00 to 6.50
Agricultural malleable	5.50 to 6.00
Pipes and flues	6.00 to 6.50
Railroad sheet and tank scrap	6.00 to 6.50
Railroad grate bars	6.75 to 7.00
Machine shop turnings	5.00 to 5.50

Boston

BOSTON, MASS., May 4, 1915.

Old Material.—The tendency of prices is upward, though transactions are as a rule on the same basis as a week ago. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. Mill prices are approximately 50c. per ton higher.

Heavy melting steel	\$8.25 to	\$8.50
Low phosphorus steel	13.75 to	14.75
Old steel axles	12.75 to	13.25
Old iron axles	20.25 to	20.75
Mixed shafting	12.00 to	12.25
No. 1 steel wrought and soft steel	8.25 to	8.75
Skeleton (bundled)	5.50 to	5.75
Wrought-iron pipe	7.00 to	7.50
Cotton ties (bundled)	5.25 to	5.75
No. 2 light	3.25 to	3.75
Wrought turnings	5.00 to	5.50
Cast borings	5.00 to	5.25
Malleable	7.50 to	7.75
Stove plate	7.00 to	7.50
Grate bars	5.25 to	5.50
No. 1 machinery cast (price to consumer)	13.00 to	13.50
No. 2 machinery cast (price to consumer)	11.50 to	12.00

New York

NEW YORK, May 5, 1915.

Pig Iron.—The trade attaches significance, and justly, to the recent speculative purchases of pig iron. These amount to about 200,000 tons, including the round lot taken a few weeks ago by a group of Buffalo capitalists. In New York City a number of persons in command of money have bought probably 150,000 tons of iron, mostly from Buffalo and Alabama furnaces, in the belief that prices are now as low as they will be in a good many months. A moving influence was the fact that non-ferrous metals have all had large advances, while pig iron has been scraping on the bottom. To find a parallel for the low prices of recent months one must go back to 1904. The effect of these purchases, in which Southern iron participated to a considerable extent, has been to stiffen the Southern market materially, and advances there are from 25c. to 50c. a ton. In the New York market the principal transaction was a purchase by a company on the Sound, of about 4000 tons, divided between Southern and Lehigh Valley irons. A number of smaller transactions are reported and there are indications of a gradual increase, at least in spots, of the melt of foundry iron. Virginia iron has been advanced by one maker to a basis of \$13 at furnace for No. 2 X, as against \$12.50 recently. On lower grades this company has advanced its asking price 25c. Other Virginia producers are holding to their former prices. We quote as follows, at tidewater: No. 1 foundry, \$14.25 to \$14.50; No. 2 X, \$14 to \$14.25; No. 2 plain, \$13.75 to \$14; Southern iron, \$14.50 for No. 1 and \$14 to \$14.25 for No. 2.

Ferroalloys.—British producers of ferromanganese have advanced their quotation from \$78 to \$88, seaboard. Consumers who have not already readjusted their old contracts by averaging with the \$78 price must do so at the new one in order to obtain the alloy. It is understood that there are very few who have not provided for their needs. The new quotation is for forward delivery, but it is admitted that there is not much metal obtainable, the demand for the application on old contracts of the cargoes now coming being insistent. Of the 8000 to 10,000 tons reported as released under the recent temporary lifting of the British embargo only about 3000 tons has reached this side. Another 3000 tons is expected this week on the Appenine. It is understood that arrangements for further shipments in May are being made, but the amount to be released is not yet known. The demand for 50 per cent. ferrosilicon is good at the ruling quotation of \$71 to \$73, Pittsburgh.

Structural Material.—The number of contracts closed and the inquiries received are not large but the undertone is good and there is more confidence in the future. This is based on the knowledge of new projects of substantial tonnage that are likely to come before fabricators in the near future. It is believed that May will be fully equal to April, which was a fairly satisfactory month. The largest inquiry in the past week was one for 14,500 tons for section 2, route 49, of the Brooklyn Elevated Railroad, known as the Culver line, bids on which are to go in May 18. In addition to this bids are asked on 1500 tons for a loft building on East Thirty-third street for Wheeler & Clark; 250 tons for a building for the Stevens Milk Company, Brooklyn; 300 tons for two bridges for the Pennsylvania Railroad

and about 200 tons for some small bridges for the New York, New Haven & Hartford. Since last week about 13,000 tons has been awarded as follows: 2500 tons (which may later be increased to about 5000 tons) for a machine and forge shop for the Crucible Steel Company of America at Harrison, N. J., to the American Bridge Company; 2200 tons for four extensions of the elevated railroads of New York, to the Phoenix Bridge Company; 1500 tons for additions to the plant of the Scoville Mfg. Company, Waterbury, Conn., to Levering & Garrigues (may later be increased to 3500 tons); 300 tons for two bridges for the Buffalo, Rochester & Pittsburgh Railroad to the American Bridge Company; 1000 tons for the Riverside power house at Albany, N. Y., to Levering & Garrigues; 1000 tons for the Waite warehouse at Webster avenue and One Hundred and Seventy-fifth streets, to Milliken Brothers, and 3500 tons for five new units for the plant of the Remington Arms Company, 2100 tons of which went to the Pennsylvania Steel Company, and 1400 tons to the Phoenix Bridge Company. The Phoenix Bridge Company was the low bidder for a 500-ton bridge for the Central Railroad of New Jersey at Easton, Pa., and it also secured the contract for a garage at One Hundred and Seventy-fifth street and Broadway, involving 200 tons. The steel for Public School No. 93 in Brooklyn, for which T. A. Clark is the general contractor, has gone to the Lackawanna Steel Company. We quote mill shipments at 1.20c., Pittsburgh, or 1.369c., New York, and from store, 1.85c. to 1.90c., New York. The 1.20c. quotation is reported to have been adhered to on considerable April business in plain material.

Plates.—Domestic demand continues dull, local boilermakers and marine repair yards being only partly engaged. Sales of small lots are reported at the ruling quotation, but desirable specifications would admittedly bring a lower price. Recent foreign inquiries have not developed into orders. The Pressed Steel Car Company has not received an order from Russia for railroad equipment amounting to \$35,000,000 to \$40,000,000, though the report that negotiations to this end were being conducted has caused quite a flurry and there is general expectation that business will be done. May opens with about 26,000 cars on which bids are asked, including the 15,050 for the Pennsylvania Railroad and Lines West. For the 2000 cars the Pennsylvania Railroad is to build the plates are believed to have been placed outside of Pittsburgh. Orders for 2000 cars by the International & Great Northern, and 2200 by the Missouri, Kansas & Texas, are still dependent upon financing. In the week there have been no new inquiries, but the Minneapolis, St. Paul & Sault Ste. Marie is reported to have ordered 400 box and 100 automobile cars from the American Car & Foundry Company and the Chicago, Milwaukee & St. Paul 7 sleepers from the Pullman Company. We quote steel plates at 1.15c. to 1.20c., Pittsburgh, or 1.319c. to 1.369c., New York, and from store, 1.85c. to 1.90c., New York.

Iron and Steel Bars.—New orders for steel bars for domestic consumption are small, but specifications on old contracts are good. Export demand is fully equal to previous weeks and is the market's sustaining influence, April showing a good total. Bar-iron orders have about maintained the volume of last week and prices are a little firmer. We quote mill shipments of steel bars at 1.20c., Pittsburgh, or 1.369c., New York, and refined iron bars 1.20c. to 1.25c., New York. Out of store in New York iron and steel bars are 1.80c. to 1.85c.

Cast-Iron Pipe.—The city of Newark, N. J., will open bids on Thursday, May 6, for 4875 tons of 6 to 30 in. The city of Philadelphia will open bids May 25 on about 12,000 tons, comprising 17,000 ft. of 48-in., 3300 ft. of 30-in. and 21,000 ft. of 24-in. and under. Today Batavia, N. Y., opens bids on 185 tons. The Department of Water Supply, Gas and Electricity of the city of New York opens bids today on 880 tons of 8-in. pipe for the Borough of Manhattan, and on May 7 will open bids on a contractor's job involving the purchase of 450 tons of pipe for the Borough of the Bronx. The general demand for pipe continues excellent and

pipe founders are becoming more satisfied with the condition of their order books. Good inquiries are being received from Cuba and Porto Rico, while buyers at various points in South America continue to talk of placing business in this country in the near future. Prices are well maintained. Carload lots of water pipe, class B and heavier, are quoted at \$22 to \$22.50 per net ton, tidewater, for 6-in., with class A and gas pipe commanding an extra of \$1 per ton.

Old Material.—The market is firm on all grades of scrap except borings and turnings. The latter commodities are becoming more abundant by reason of the large amount of work now being done on shrapnel in numerous machine shops. Heavy melting steel scrap could be sold in considerable quantity if holders were willing to meet consumers' views, but the former are confident that higher prices can shortly be obtained and are awaiting developments. A little more business is being done in railroad wrought scrap, especially with New Jersey consumers. Buyers who have long been out of the market are now beginning to take some interest. Brokers' quotations to local dealers and producers, per gross ton, New York, are as follows:

Old girder and T rails for melting	\$8.75 to \$9.25
Heavy melting steel scrap	8.75 to 9.25
Relaying rails	19.00 to 19.50
Rerolling rails (nominal)	8.75 to 9.25
Iron car axles (nominal)	15.25 to 15.75
Old steel car axles (nominal)	11.75 to 12.25
No. 1 railroad wrought	10.25 to 10.75
Wrought-iron track scrap	9.50 to 9.75
No. 1 yard wrought, long	9.50 to 9.75
No. 1 yard wrought, short	8.75 to 9.25
Light iron	3.25 to 3.75
Cast borings	5.50 to 5.75
Wrought turnings	6.00 to 6.25
Wrought pipe	7.75 to 8.25

Foundries are buying a little more freely, but their purchases are not involving any large quantities. Quotations to consumers on cast scrap are as follows, per gross ton, New York:

Old carwheels	\$9.00 to \$9.25
No. 1 heavy cast, broken up	11.50 to 11.75
Stove plate	8.00 to 8.25
Locomotive grate bars	7.50 to 8.00
Malleable cast (railroad)	8.00 to 8.25

San Francisco

SAN FRANCISCO, CAL., April 27, 1915.

The market on this coast lacks the stimulating features noted in some other quarters, depending almost entirely upon ordinary domestic requirements, which are still considerably below normal. The past month, however, has brought a material improvement in general consuming lines. Large crops and a renewal of interest in development work promise a gradual expansion of activity.

Bars.—Inquiries for both plain and deformed bars show a gradual increase, though the aggregate tonnage is still light, and lively competition between local and Eastern mills keeps the market somewhat unsettled. One fairly large local order for reinforcing bars has gone to an Eastern mill. Implement manufacturers are exceptionally busy, and are specifying freely, but only for nearby requirements. The small jobbing trade also shows rather more life, but merchants are fairly well supplied, and are merely filling in depleted sizes.

Structural Material.—The Judson Mfg. Company has taken the Rainier brewery job; the Pacific Rolling Mill Company is low on the public library, about 2000 tons; and it is understood that the University Hospital contract, about 1100 tons, will be placed with the United States Steel Products Company. The Mortenson Construction Company has taken about 100 tons for a normal school at Fresno, Cal.; the California Construction Company has a small bridge in the Yosemite National Park, and Dyer Bros. have taken the Christian Science Church job in Oakland. The city of Oakland is taking bids this week for a steel wharf shed, 91 x 402 ft. Provision has been made for the construction of a new custom house at Manila, to cost \$750,000.

Cast-Iron Pipe.—The largest order placed in the last fortnight was for about 11,000 tons for the Sacramento waterworks, which went to the United States Cast Iron Pipe & Foundry Company. Inquiries on which bids will be taken this week include 700 tons for Los Angeles,

185 tons for Imperial, and small lots for Phoenix, Ariz., and Bellingham, Wash. The town of Palo Alto, Cal., has received figures on 20,000 ft. of 4-in. and 2500 ft. of 6-in. Prices at Pacific coast terminals remain at \$34 per net ton for 4-in., \$32 for 6-in., and \$1 extra for gas pipe, the market being quite firm at these figures.

British Market Featureless

Labor Situation Difficult and Strikes Frequent
—Ferromanganese Higher

(By Cable)

LONDON, ENGLAND, May 5, 1915.

The pig-iron market is featureless and trade is very limited. Hematite iron is easier with more ore available and lower prices are being accepted. The general labor situation is very difficult and strikes are sporadic all over the country, advance after advance in wages being regarded as insufficient. The furnaces in blast are 163 as compared with 169 a year ago. Stocks of pig iron in Connal's stores were 144,210 tons at the close of last week against 140,298 tons one week previous.

American semi-finished steel has sold at about £6 15s. (\$32.85), c.i.f. Liverpool. Finished steel is firm but business is restricted. Tin plates are strong. Germany's steel output for March is 1,098,273 metric tons. We quote as follows:

Tin plates, coke 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 17s. 9d. (\$4.32), against 17s. 4½d. (\$4.23) last week.

Cleveland pig-iron warrants, 65s. 4d. (\$15.90).

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 65s. 9d. (\$16), compared with 65s. (\$15.82) a week ago.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £11 5s. (\$54.75).

Steel ship plates, Scotch, delivered local yards, £9 15s. (\$47.44).

Steel rails, export, f.o.b. works port, £8 (\$38.93).

Hematite pig iron, f.o.b. Tees, 102s. 6d. (\$24.94), against 105s. (\$25.55) last week.

Sheet bars (Welsh), delivered at works in Swansea Valley, £7 (\$34.06).

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £9 10s. (\$46.23).

Steel bars, export, f.o.b. Clyde, £10 2s. 6d. (\$49.27), against £10 (\$48.66) a week ago.

Ferromanganese, f.o.b., £17 15s. (\$86.38), against £15 10s. (\$75.42) a week ago.

Ferrosilicon, 50 per cent., c.i.f., £14 (\$68.13).

Hematite Iron Higher—Labor Conditions More Serious, with Strikes Threatened

(By Mail)

LONDON, ENGLAND, April 23, 1915.—With little change in fundamental conditions in the British iron trade activities on merchant and private account are steadily diminishing, as more and more close concentration is demanded on the provision of war munitions. There has been some irregularity in the prices of Cleveland warrants, arising partly from the disposition to realize the considerable profits which have accrued. The position as to raw material has not undergone any modification, the scarcity of fuel being still very marked while local ore supplies are scarce and labor obtainable with difficulty. It is understood that permits have now to be obtained for the shipment of pig iron abroad. This has done something to relax the stringency of the market, and it is not forgotten that the enforcing of licenses to ship had a salutary effect in breaking down artificial premiums of early deliveries in the case of tin and lead. The official notice issued is to the effect that "foundry iron is to be regarded as within the prohibition of hematite pig iron."

HEMATITE IRON STRONG AND HIGHER

The hematite iron position is one of increased strength, and the value of East Coast mixed numbers is today about £5 10s. (\$26.76) a ton. It is very doubtful whether makers would sell at anything below this figure while some of them ask even more. Practically every furnace is completely sold out up to the end of

June, and there are cases in which makers have disposed of their production up to the end of the year. The ore position is one of considerable strength, and Rubio is now about 30s. 6d. to 31s. (\$7.42 to \$7.54) a ton c.i.f. Tees. Labor is exceedingly fractious and in Cumberland 17 furnaces stand a very good chance of being blown out because of a strike of the workmen. The iron masters refused a war bonus because from March 31 wages have been increased 22½ per cent. under the sliding scale, a bigger rise than that represented in other directions by the sliding scale advance and the special bonus combined. But there is no end to the demands which labor is now making, and the probability is that the men will have to be granted everything they ask for. Serious trouble seems also to be brewing in the coal trade, and the South Wales Miners' Federation has just recommended the 143,000 workmen under its control to go on strike for an advance of 20 per cent. in wages.

STRIKE AMONG MAKERS OF SHELLS

There is a firm tone in all directions in the finished iron and steel trades and prices continue to advance. A scandalous amount of time is being lost, however, and the whole policy of the labor party seems directed to securing minimum output at maximum cost. Within the last day or two, there has been a strike among the men employed in making shells at Dudley, and at Walsall makers of horse collars for the artillery refused to start work on Monday except at a considerable advance in wages. It is impossible to think that this sporadic labor trouble would be possible except for the callousness of the Government in respect to the censorship. The concealing of bad news, the magnifying of trivial successes, the lack of cohesion in operations, the delay, the muddle and the juggling with figures are producing the inevitable result.

Metal Market

The Week's Prices

NEW YORK, May 5, 1915.

Cents Per Pound for Early Delivery

Copper, New York	Electro-		Lead		Spelter	
	Tin	New York	New York	St. Louis	New York	St. Louis
Apr. 28.....	21.00	18.75	41.50	4.20	4.07 1/2	14.25
						14.00
May 1.....	21.00	18.62 1/2	40.00	4.20	4.07 1/2	14.25
						14.00
May 3.....	21.00	18.62 1/2	39.50	4.20	4.07 1/2	14.25
						14.00
May 4.....	21.00	18.62 1/2	39.50	4.20	4.07 1/2	14.25
						14.00

Copper is quieter but prices are unchanged. Tin is inactive and lower. Lead is easier. The demand for spelter has diminished and it has declined a little. Antimony is higher and eagerly sought.

New York

Copper.—For Lake copper there is a wide range of prices. One choice and favorite brand has been sold in large quantities at 23c., but the fact remains that excellent brands of prime Lake can be had at 21c. and other grades at 20c. Electrolytic is quoted to-day at 18.62½c. by second hands, although some of the producers continue to ask 19c., full terms, or 18.87½c., 30 days, delivered. The brass mills are now believed to be filled up to October, although the war requirements constitute an unknown quantity. The market is considerably quieter but nevertheless firm. The London market has been somewhat erratic in the past few days, which is attributed to speculation rather than to supply and demand. The exports this month total 3471 tons.

Copper Averages.—The average price of Lake copper for the month of April, based on daily quotations in *The Iron Age*, was 18.90c., and of electrolytic, 17c.

Tin.—Except for occasional inquiry and small purchases the market has been dull. On April 29 there was some desire on the part of dealers to sell futures and the next day there was some inquiry from consumers, but few transactions resulted. On Monday and Tuesday there was a little business in near-

by shipments from London and in future shipments from the Far East, but the aggregate of the quantities involved was not great. Of principal interest in the week was the fact that the tin committee of the New York Metal Exchange, which has been striving to get the British Government to modify its restrictions on the traffic in tin, finally succeeded in having a third form of agreement adopted for the benefit of retailers. The new arrangement will permit the distribution of small quantities where certain terms are complied with. The wholesale situation is unchanged. The market sagged in the week and two reasons are given for the decline. One is the light demand and the second is the low price at which Banca tin can be had. Spot metal was quoted yesterday at 39c. Arrivals this month total 100 tons and there is afloat 4260 tons, of which 725 tons is Banca.

Lead.—The market has been quiet. The demand from home consumers is light. Instead of buying, some of them are offering to sell metal to which they are committed, and such sales have been made on a basis of 4.05c., f.o.b. St. Louis, but the quantities were not large. Less is now heard of foreign buying. An interesting deduction is made from the figures of the United States Geological Survey. These showed an increase in production of primary refined lead in 1914 of 79,662 tons over 1913. The 1914 exports reached the total of 58,722 tons, a figure which was unusually large but not great enough to offset the increased production and this is taken to explain why lead prices have not responded to the war demand in the same manner as those of copper and spelter. The quotation for lead in New York yesterday was 4.20c. and that at St. Louis, 4.07½c.

Spelter.—Activity has subsided in the past two or three days and the market is easier at 14.25c., New York, and 14c., St. Louis, for spot prime Western. April 30 spot was quoted at 14.50c. to 15c. and it was hard to get even one car. Future and comparatively prompt metal is easier to get. Offerings were made on the floor of the New York Metal Exchange yesterday at 12.75c. for May, 12.50c. for June and 12c. for July in lots of 50,000 lb., but no sale resulted. Western galvanizers are carefully investigating the market before committing themselves to future deliveries of galvanized sheets. The foreign demand is strong.

Antimony.—This metal is extremely strong and prices are largely a matter of private negotiation. For Chinese metal 35c. has been paid for spot delivery, while 32½c. has been bid for Chinese in bond. The general quotation is 34½c. Cookson's is nominal at 37c. and a case is mentioned where 40c. per lb. was paid for two casks. Hallett's is nominal at 35c. England recently bought 250 tons here which discloses the situation in that country, ordinarily a source of supply.

Old Metals.—The market has lost its activity. Dealers' selling prices are nominally unchanged, as follows:

	Cents
Copper, heavy and crucible.....	17.00 to 17.50
Copper, heavy and wire.....	16.50 to 17.00
Copper, light and bottoms.....	14.00 to 14.50
Brass, heavy.....	11.00 to 11.50
Brass, light.....	8.50 to 9.00
Heavy machine composition.....	13.25 to 13.75
No. 1 yellow rod brass turnings.....	10.25 to 10.75
No. 1 red brass or composition turnings.....	11.00 to 11.25
Lead, heavy.....	3.75
Lead, tea.....	3.50
Zinc, scrap.....	8.00

Chicago

MAY 3.—Copper, spelter, zinc and antimony prices continue to soar and business is restricted to such buying as the trade finds it impossible to avoid. Dealers are offering better prices for scrap metals in keeping with the enhanced values of the new materials. We quote as follows: Casting copper, 18c.; Lake copper, 18.75c. to 19.25c., for prompt shipment; small lots, ¾c. to ¼c. higher; pig tin, carloads, 41c., small lots, 43c.; lead, desilverized, 4.12½c., and corrodin, 4.35c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, nominally, 14c.; sheet zinc, 17.50c., or price ruling date of shipment; Cookson's antimony, 40c., for cask lots; other grades, 34c. to 35c. On old metals we quote

buying prices for less than carload lots as follows: Copper wire, crucible shapes, 14.50c.; copper bottoms, 13.50c.; copper clips, 14c.; red brass, 11.75c.; yellow brass, 10.25c.; lead pipe, 3.375c.; zinc, 8.50c.; pewter, No. 1, 27c.; tinfoil, 32c.; block tin pipe, 37c.

St. Louis

MAY 3.—Non-ferrous metals have been active and quotations are generally advanced. Lead, however, remains at about 4.25c. Spelter is quoted at 15c., with little doing at this price; tin, 44c.; Lake copper, 20c.; electrolytic copper, 19.50c.; Cookson's antimony, 36c. In the Joplin ore market zinc blende jumped \$10 per ton, selling at \$70 to \$75, with the premium settlement for the choicest \$78. This equals the record of February, but the market is much stronger than it was then. Calamine reached the record price of \$47, while the premium grades brought better than \$52. Lead ore was unchanged at \$51. Miscellaneous scrap metals are quoted as follows: Light brass, 8.75c.; heavy yellow brass, 9.75c.; heavy red brass and light copper, 12.25c.; heavy copper and copper wire, 15c.; tinfoil, 35c.; pewter, 25c.; zinc, 9c.; lead, 3.60c.; tea lead, 3.25c.

Iron and Industrial Stocks

NEW YORK, May 5, 1915.

Sensational advances were recorded in a number of industrial stocks in the past week, particularly those of companies reported to have received large orders for munitions of war. Conspicuous in the advances were the stocks of the Westinghouse Electric & Mfg. Company, General Electric Company and Crucible Steel Company of America. United States Steel common scored a notable gain, as also did Pressed Steel common and Lackawanna Steel. A reaction from the high level of prices took place on Monday and Tuesday, for which the principal excuse was the possibility of friction between the United States and Germany over an attack on an American vessel. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	15 7/8 - 19 1/2	Pressed Stl., com.	46 - 59 3/4
Allis-Chal., pref.	51 - 54	Pressed Stl., pref.	98 - 100 1/2
Am. Can., com...	38 3/4 - 44 1/2	Ry. Spring, com.	32 1/2 - 40
Am. Can., pref...	99 - 100 1/2	Ry. Spring, pref.	93 1/4 - 94 1/2
Am. Car & Fdy., com.	54 1/2 - 58 1/2	Republic, com...	29 - 32
Am. Car & Fdy., pref.	116	Republic, pref...	85 1/2 - 88 3/4
Am. Loco., com.	52 1/2 - 61	Rumely Co., com.	3 1/2 - 4 3/4
Am. Loco., pref.	97 1/4 - 98 1/2	Rumely Co., pref.	9 1/2 - 14 1/2
Am. Steel Fdries	35 3/4 - 40	Sloss, com...	37 1/4 - 40
Bald. Loco., com.	51 1/2 - 61 1/2	Pipe, com...	14 1/2 - 15 7/8
Bald. Loco., pref.	101 1/2 - 102	Pipe, pref...	44 7/8 - 45
Beth. Steel, com.	131 1/4 - 148	U. S. Steel, com.	60 7/8
Beth. Steel, pref.	111 - 112 1/4	U. S. Steel, pref.	108 1/4 - 110 3/4
Colorado Fuel...	30 7/8 - 34 1/2	Va. I. C. & Coke	41 - 42
Deere & Co., pref.	90 - 90 1/2	West'gh'se Elec.	86 3/4 - 108
General Electric	153 1/2 - 162	Am. Ship, com...	34 1/2
Int. Harv. of N. J., com.	36 - 39 1/4	Am. Ship, pref...	71
Int. Harv. Corp., com.	98 - 101 1/2	Chic. Pneu Tool	57 1/2 - 61 7/8
Int. Harv. Corp., com.	71 1/2 - 73 1/2	Cambric Steel	49 1/4 - 50 1/2
Int. Harv. Corp., pref.	105	Lake Sup. Corp.	6 1/2 - 8 1/2
Int. Pump, com...	5 1/2 - 7 1/4	Warwick	9 1/2
Int. Pump, pref...	15	Cruc. Steel, com.	17 1/4 - 25 1/2
Lackawanna Stl.	39 1/2 - 49	Cruc. Steel, pref.	84 - 87 1/2
Nat. En. & Stm., com.	15 1/2 - 17 1/2	Harb.-Walk. Ref., com.	48
		Harb.-Walk. Ref., pref.	99
		La Belle Iron, com.	31 - 32
		La Belle Iron, pref.	107

Dividends

The Inland Steel Company, regular quarterly, 1 per cent., payable June 1.

The Pressed Steel Car Company, regular quarterly, 1 1/4 per cent. on the preferred stock, payable May 26.

The Standard Sanitary Mfg. Company, regular quarterly, 1 1/2 per cent. on the common stock and 1 1/4 per cent. on the preferred stock, payable April 27.

The United Engineering & Foundry Company, regular quarterly, 1 1/4 per cent. on the preferred stock.

The Studebaker Corporation, regular quarterly, 1 1/4 per cent. on the preferred stock, and an initial quarterly of 1 1/4 per cent. on the common stock, both payable June 1.

The E. W. Bliss Company, Brooklyn, N. Y., has opened its own office and warerooms at 622 West Washington street, Chicago.

Pittsburgh and Nearby Districts

The American Sheet & Tin Plate Company will erect a modern office building at its plant at Farrell, Pa., will replace its wooden box factory with a steel and concrete building, and will build a new carpenter shop, the total improvements to cost about \$50,000.

The report that the Clinton Iron & Steel Company will build a second blast furnace at Pittsburgh is untrue. The company is building a new cast house and installing a casting machine to make chilled foundry and basic iron. Its Clinton furnace is being prepared for blast, and is expected to go in the latter part of this month.

Applications for about 1100 laborers, to be supplied between now and June 1, have recently been made to the Youngstown Free Employment Bureau, Youngstown, Ohio. Requests for 600 of these men came from the Youngstown Sheet & Tube Company, which will make large additions to its works this summer. Skilled workmen are also in demand in Youngstown, owing to the activity in the steel mills.

The Carnegie Steel Company is negotiating for the purchase of a large number of machine tools and other equipment for the new finishing plant to be erected at its Homestead works for making of steel ties, and it is also in the market for a heavy punch.

The Youngstown Foundry & Machine Company, Youngstown, Ohio, maker of sand and chilled rolls and iron and steel works machinery, has secured the exclusive right for the manufacture and sale of the Thompson-Jones patent cinder ladle. The construction of this ladle is such that any cracking that may occur will be above the cinder line, or where the ladle is the thinnest. The ladle being larger in diameter at this point, where the cracking occurs, this makes it a self-skulling ladle, thus reducing labor cost.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has not yet placed the contract for its by-product coke ovens, but will likely do so within a short time.

The LaBelle Iron Works, Steubenville, Ohio, has decided to erect a block of by-product coke ovens, to make coke for its two blast furnaces. The exact number and the type of oven have not yet been determined upon. It is probable, also, that the company will make some large additions to its plant this year, to include more sheet mills and possibly one or two new lines of products.

The Standard Steel Car Company of Pittsburgh is turning out a large number of 6-in. shells for the allies at its plant at New Castle, Pa.

The monthly meeting of the Association of Iron and Steel Electrical Engineers was held in the Seventh Avenue Hotel, Pittsburgh, May 1, preceded by a dinner. R. S. Wile, president Wile Electric Furnace Company, Pittsburgh, read a paper on "The Electric Furnace for the Melting of Alloys." The discussion was participated in by Dr. J. S. Unger, chief of the metallurgical department of the Carnegie Steel Company, and J. F. Bailey, Bailey Electric Furnace Company, Alliance, Ohio. The next meeting of the association will be held at the German Club, Pittsburgh, June 5, and after that no further meetings will be held until October.

The Weirton Plate Structural & Construction Company, Wheeling, W. Va., in its answer to the involuntary bankruptcy petition filed several weeks ago, admits insolvency and asks to be adjudged a bankrupt.

The Meehan Boiler & Construction Company, Lowellville, Ohio, has received a contract for two steel stacks, 5 ft. and 6 ft. in diameter and 125 ft. high, for the new open-hearth steel plant of the Youngstown Iron & Steel Company.

Bids are being received by the city of Alliance, Ohio, for an elevated steel tank of 40,000 gal. capacity for its waterworks system. Plans are being made by Chester & Fleming, engineers, Pittsburgh.

Operations among the steel plants in the Youngstown district this week are on a slightly lessened rate.

OBITUARY

Nathan A. Taylor

Nathan A. Taylor, senior member of the N. & G. Taylor Company, manufacturer of tin plate, died of heart failure, after a short illness, at his home at Chestnut Hill, Philadelphia, April 26, aged 69 years. He entered in 1867 the firm of which his grandfather was one of the founders and up to his decease had been associated in it with other members of the Taylor family. For many years after its establishment the



NATHAN A. TAYLOR

house was engaged in the importation of tin plate and became one of the largest in the country in that trade. It dates back to more than a century ago, having been founded in 1810 by three brothers—William, George and Tracy Taylor. In 1830 the firm sold the first terne plates for roofing plates ever made, laying the foundation for the prominence of the house in the manufacture and sale of high grade roofing tin. In 1891, following the McKinley protective tariff legislation, Mr. Taylor launched his firm into the manufacture of tin plate, boldly taking the lead in establishing this industry in America. Unlike many pioneers in a new line of manufacture, his venture was successful and his company became one of the most prominent in the tin-plate industry in this country, having large factories at Cumberland, Md., with central offices in the Mariner & Merchant Building, Third and Chestnut streets, Philadelphia. Mr. Taylor was actively identified with public movements in his city and was a member of the Union League, the Philadelphia Country Club, Down Town Club, Philadelphia Cricket Club and numerous other associations. He leaves his widow and four daughters. The business will be continued under the direct personal management of the surviving members of the firm.

CHARLES E. WETMORE, treasurer and director of the American Hardware Corporation, New Britain, Conn., died April 26, after an illness of a few weeks, aged 60 years. He was born in New Britain and entered the service of P. & F. Corbin as a boy of 16. He was soon promoted to invoice and when the estimating department was created in 1874 he was transferred to it, and in 1880 he became its manager, which position he filled until he assumed charge as superintendent of the manufacture of the company's product in 1896. On

February 18, 1891, he was elected secretary of P. & F. Corbin, and was made a director February 28, 1897. On October 5, 1903, he became treasurer of the company, and then devoted his attention to its financial interests. On February 20, 1905, he was elected second vice-president of P. & F. Corbin and was made first vice-president February 17, 1908. When the American Hardware Corporation was formed, in March, 1902, Mr. Wetmore was made the secretary. On January 1, 1912, he became the treasurer of the American Hardware Corporation, a position he held at the time of his death. He was a director of that company from its formation. He served for two years in the Common Council and was identified with the various organizations and movements which tend to a better community. He was a director of the Y. M. C. A., a supporter of the New Britain Charity Organization, of the City Mission and of the Boys' Club, and was actively interested in their welfare. At the time of his death he was president of the New Britain Club, a member of the Country Club, the New Britain Golf Club and of other local social and fraternal organizations. He was president of the Hartford Choral Society, and took an active part in its work. He was also a director of the New Britain Trust Company. He married a daughter of Andrew Corbin.

BENJAMIN J. WALKER, vice-president Erie Malleable Iron Company, Erie, Pa., died in San Francisco, Cal., April 30. He left Erie five weeks ago with Mrs. Walker for a trip to Japan, but on reaching San Francisco was stricken with apoplexy. He was born in Dayton, Ohio, and located in Erie 30 years ago, when he became associated with George R. Metcalf, now president Erie Malleable Iron Company, and the late Joseph Metcalf, in the operation of the company's plant. His ability and agreeable personality won for him a prominent place among the business men of the city. He leaves his widow, two daughters and one son, the latter being Edward E. Walker, superintendent of the company.

THOMAS ANDERSON, special representative of the Jones & Laughlin Steel Company, Pittsburgh, died in a hospital in that city April 27, from an operation for peritonitis, aged 40 years. He was born in Belfast, Ireland, and with his parents came to this country when a boy. His first employment was with the Oliver Iron & Steel Company and later with the Carnegie Steel Company in a minor capacity, but more than 20 years ago he went with the Jones & Laughlin Steel Company in the order department, and in 1910 was made manager of orders. Later he was made special representative of the company, acquiring a very wide acquaintance. He leaves his widow and three children.

GEORGE NOBLE, one of the six Noble brothers who were long prominent in the manufacture of pig iron at Anniston, Ala., died at Cedartown, Ga., April 25, aged 72 years. These brothers were natives of England, who came to this country many years ago, first settling at Reading, Pa., and then moving to the South just before the Civil War. The only surviving brother is John Ward Noble, now residing in Anniston. George Noble leaves his widow, two daughters and three sons.

GEORGE M. RUSSELL, of late years advertising manager with J. H. Williams & Co., 150 Hamilton avenue, Brooklyn, N. Y., died at his home in that city, April 23. He had been connected 24 years with the firm, first as purchasing agent and then as advertising manager. He leaves his widow, a son and a daughter.

JOSEPH FRANCIS DIXON, JR., foreign sales manager for the Allis-Chalmers Mfg. Company, died at his home in Brooklyn, N. Y., April 30, aged 41 years. He was born in Philadelphia. He leaves his widow and two children.

The Browning Company, Cleveland, Ohio, has been awarded the contract by the Alaska Railroad Commission for a locomotive crane to cost \$6000. The crane will be shipped to Seattle and will thence go to Alaska by boat. The company has furnished 28 similar locomotive cranes for use in the Panama Canal zone. These cranes are capable of making complete revolutions at each point on the railroad track on which they run.

PERSONAL

O. L. Remington, general manager, and H. P. McColl, engineer, representing William McLean & Co., engineers and importers, Melbourne, Australia, are now in the United States on business with iron and steel and machinery companies. Mr. McColl's address for the present is the Hotel LaSalle, Chicago, and after a week or more there Mr. Remington will join him in a tour, taking in important iron and steel and metal working centers, the trip ending at New York.

Joseph Pruyk, a member of the Brussels Chamber of Commerce, is now in New York calling on machinery and machine-tool firms with a view to increasing the sale of these products in Belgium. His address is 1 West 102d street.

John F. Hale has resigned his position with the Warren-Webster Company, Camden, N. J., to become associated with the Consolidated Engineering Company, Chicago, and will be permanently located in that city.

John H. Hall, 2 Rector street, New York City, has discontinued his practice as consulting engineer and has entered the employment of the Taylor-Wharton Iron & Steel Company, High Bridge, N. J., as metallurgical engineer.

John E. Sullivan, for ten years general sales manager of the Carpenter Steel Company, Reading, Pa., has resigned, effective May 1. His plans for the future are not yet announced.

Charles A. Billings, for 33 years identified with the structural steel business, has resigned as manager of the Brooklyn plant of the American Bridge Company, and will devote his entire time to personal interests. At a dinner given in his honor at the Hotel McAlpin, New York, on the evening of April 30, he was presented with a loving cup by employees of the company. Previous to his connection with the American Bridge Company he was manager for Post & McCord for many years.

James A. Burden, president Burden Iron Company, Troy, N. Y., was elected a director of the American Iron and Steel Institute at the annual meeting this week, succeeding Ferdinand W. Roebling of the John A. Roebling's Sons Company, who did not desire re-election in view of his less active connection with the steel trade. James A. Campbell, Thomas J. Drummond, John C. Maben, William A. Rogers, Jesse F. Welborn and Frank S. Witherbee were re-elected for a term of three years.

Marcus W. Saxman, president Latrobe Connellsville Coke Company, has resigned and sold his holdings to parties connected with the Keystone Coal & Coke Company. The main offices will be removed to Greensburg, Pa.

Alex Schwalbach will sever his connection with the Bearings Company of America, June 1. For six years he has been in charge of advertising and publicity for the F & S bearings imported by the former J. S. Bretz Company, and its successor, the Bearings Company of America, 250 West Fifty-fourth street, New York. He has had a long selling experience in the bicycle, motor cycle and automobile business.

Robert Bentley, president Ohio Iron & Steel Company, Lowellville, Ohio, has gone to the Adirondacks, where he has a large estate, for a month's vacation.

W. J. Morris has been appointed assistant secretary and assistant treasurer of the Youngstown Sheet & Tube Company, Youngstown, Ohio. He had been performing the duties of these offices for some time, but his formal appointment was made effective May 1. Alfred G. Place was made chief electrician, and W. Forkensworth his assistant, on the same date.

Frank Barry has been appointed traffic manager of the Merchants' & Manufacturers' Association of Milwaukee, effective May 1, to succeed Archie M. Camp-

bell, who resigned to engage in other business after serving five years. Mr. Barry is a graduate of the University of Illinois and has had a long experience in transportation work.

Founders' Day exercises were held at Carnegie Institute of Technology in Pittsburgh, April 29. By reason of illness, Andrew Carnegie was not able to be present, but sent a letter of congratulation on the successful year of the Institute. He also gave the Institute \$2,700,000 more, of which \$1,200,000 will be spent for new buildings and \$1,500,000 for endowment, to be paid in the years 1915 and 1916. This new gift makes a total of \$27,000,000 which Mr. Carnegie has given to the Carnegie Institute of Technology and the Carnegie Training Schools in Pittsburgh.

Charles M. Schwab and a party of 30 relatives and friends started April 29 for San Francisco, to return about June 1.

William A. Sproull, traffic manager of the Cambria Steel Company, headquarters at Pittsburgh, has been nominated for president of the Traffic Club of Pittsburgh and will be elected at the annual meeting in June, as he has no opposition.

Lawrence Addicks, of Douglas, Arizona, was elected president of the American Electro-Chemical Society at its annual meeting at Atlantic City, April 22, 1915.

William Campbell has been promoted from associate to professor of metallurgy at Columbia University, New York City.

W. L. Wright has been made vice-president and director of the Keystone Watch Case Company, Philadelphia. He was formerly vice-president of the Taylor-Wharton Iron & Steel Company.

A. W. Van Buren, for 17 years connected with the Chicago office of the Niles-Bement-Pond Company, is now representing the E. L. Essley Machinery Company in the Chicago territory.

Robert Geddes, who went abroad about five months ago to investigate trade conditions for the Jones & Laughlin Steel Company, Pittsburgh, has returned. He made his headquarters in London, England, and thoroughly canvassed the foreign situation, on which he will report to his company. Mr. Geddes believes that England and its allies will continue to be large buyers of materials from this country for some months.

The Standard Tin Plate Company, Canonsburg, Pa., whose plant has 10 hot mills, is planning to add 12 hot mills, with the necessary equipment of doubling and squaring shears, heating and annealing furnaces, and probably 10 to 12 cold mills. It is getting estimates of the cost for these additions and improvements, and will likely come to a definite decision in the matter within a short time. The Continental Can Company is a large stockholder in the Standard Tin Plate Company and takes a good part of its output of bright plate.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., has received an order from the Wheeling Steel & Iron Company for two 28-in. hot mills, squaring and doubling shears and other equipment to be installed in the latter's plant at Yorkville, Ohio. The Mold & Foundry Company has also received two large orders for war materials, one of which calls for machining 250,000 shrapnel shells.

Alfred P. Stewart, who last year purchased a controlling interest in the L. A. Green Equipment Company, steel railroad supplies, announces that he will continue the business under his own name, with offices at 202 Oliver Building, Pittsburgh.

The Toledo Bridge & Crane Company, Toledo, Ohio, has taken an order for 800,000 brass shells to be used for shrapnel cases. It is understood that this order will amount to about \$1,500,000.

Machinery Markets and News of the Works

SKILLED LABOR IS SCARCE

Automobile and Tool Makers Need Men

Big Plant Extensions Are Building or Contemplated to Facilitate the Output of War Supplies

It is commented that the orders for war supplies and the machines for making them are bewildering and this is true. Only the future will disclose their true magnitude. A secondary effect of the war business is the hastened construction of new plants and extensions to old ones. Two problems confront those who have large war orders—the difficulty in getting prompt deliveries of machine tools and difficulty in getting skilled mechanics to operate them. The machine-tool builders are themselves having trouble in getting a sufficient amount of skilled help, especially in view of the fact that the busy automobile manufacturers are winning men over by attractive offers. In both New England and New York the war demand continues to absorb attention, while in the latter city domestic activity is growing steadily. In Detroit the automobile industry and metal trades generally are in good condition, partly because of war orders. Chicago reports some big business, despite the fact that the railroads have not yet bought against recently issued lists. Domestic requirements are coming more to the front in Milwaukee and the war business is less conspicuous. A large number of screw machines for export to Russia have been bought in Cleveland; the automobile trade is buying in large volume and the miscellaneous business is holding up well. The leading demand in Cincinnati is for lathes, but the call for planing machines, radial drills, etc., is quite active. New enterprises are on the increase in the Central South and machine tools are moving better. Trade conditions are improving in Texas. There has been a gradual improvement in conditions in the Pacific Northwest, but exports are hampered by the high ocean freights and shortage of vessels, which has caused freight to accumulate at Pacific ports.

New York

NEW YORK, May 5, 1915.

The large order for shells to be supplied to Great Britain, referred to a week ago as having been taken by the American Locomotive Company, calls for 5,000,000 shrapnel, half of which are to cost \$14 and the other half \$12.50 each, making the total order amount to about \$66,250,000. It is reported that one-half of the contract will be divided between the Westinghouse Air Brake Company and the New York Air Brake Company. The latter two companies have been negotiating for war business for several months.

Chairman Tripp of the Westinghouse Electric & Mfg. Company last week authorized a statement that his company had received a large order from a foreign government, the details of which are yet to be worked out. It is understood from other sources that the company's order amounts to about \$50,000,000. The company has for some time been engaged in filling certain orders for war material.

In preparation for handling its war business the Westinghouse Air Brake Company has completed plans for the erection of several shop buildings at Wilmerding, Pa. They will be needed to house the large number of machine tools which

it has purchased of late. Two of the buildings will be 100 x 500 ft.; one will be 65 x 200 ft., another 80 x 150 ft. There will be some smaller buildings as well. Work has already been started.

The Remington Arms Company has made additions to its plant at Ilion, N. Y., as heretofore reported, and its new plant at Bridgeport, Conn., is a big undertaking. In the latter city the company has 10 large buildings, finished or under way, and has just let a contract for 2000 tons of steel for further operations.

The Fox Gun Company, Philadelphia, has been buying heavily of late to improve its facilities for filling a large Russian order for rifle barrels. It has taken about 300 tools.

The Baldwin Locomotive Company is working on 4.7-in. shells and is expecting a large order along similar lines.

The Harrisburg Pipe & Pipe Bending Company, Harrisburg, Pa., has purchased another lot of 40 LeBlond engine lathes. The American Locomotive Company has added 206 American lathes and 50 Bardons & Oliver turret lathes to those previously purchased. The Nathan Mfg. Company has been a large purchaser of machines to be used in making fuse parts for the American Locomotive Company. Other companies turning out munitions of war are almost daily buyers, even though they have to wait for deliveries.

Selling conditions in the cases of machines needed for manufacturing war material are the reverse of what they are in normal times. To-day the buyer seeks the seller and the latter has his hands full in arranging deliveries. Some tool builders have notified their representatives to sell but two or three machines a week. From the Central West it is reported that the automobile companies are taking skilled mechanics away from the tool builders and the latter are having trouble in getting sufficient help to keep their plants running night and day. One automobile truck manufacturer in the West is assembling his machines in a tent.

The shortage of machine tools will be felt at some of the approaching exhibitions. The maker who is to show two machines at the exhibit of the Railway Supply Manufacturers' Association at Atlantic City already has sold them, delivery to be made at the close of the exhibition. From San Francisco it is learned that sales are being made of the tools exhibited at the fair. Some of the machines have been purchased by Russians visiting the exposition. Some recent sales in New York were for export to Belgium, one firm having sold 11 tools in the past few days for delivery to that country.

While the railroads are backward in buying machine tools, they are regarded hopefully as prospects as their shop equipment in many cases is known to be in poor condition. There is a good run of miscellaneous orders from industrial companies for one or two tools, and more could be done were deliveries better. Planing machines are selling well to makers of other types of machine tools and the makers of drilling machines are busy in supplying tools to be used in the manufacture of shrapnel fuse timers.

At present there are more Russians here interested in buying than ever before. They are inquiring almost entirely for 5/8 to 2 in. turret lathes or automatic screw machines for the making of shrapnel parts.

It is reported that Samuel L. Moore & Sons, Elizabeth, N. J., subsidiary of the Bethlehem Steel Corporation, have completed plans for the erection of a shipbuilding plant, to be located on Staten Island Sound, on the site formerly occupied by the Lewis Nixon Crescent Shipyard Company. Application has been made to the authorities of Elizabeth to vacate certain streets now traversing the property.

According to John Fulton, Jr., real estate broker, 266 Morris avenue, Elizabeth, N. J., the Stuttgart Chemical Company, Stuttgart, Germany, is now locating a plant at Elizabeth, N. J., which will employ about 600 men. It is capitalized at about \$250,000. Another plant is being erected by the Leipzig Aniline Company, Leipzig, Germany, also at Elizabeth. The latter company is capitalized at about \$200,000.

Edward Maher & Sons, 216 Berlin street, Newark, N. J., manufacturer of soft gray-iron castings, is building a pattern storage building.

H. L. Branitz, sales agent, 115 Broadway, New York, has recently closed with the Tokio Electric Company, Tokio, Japan, for a large installation of the International Oxygen

Company's cells for the production of oxygen and hydrogen gas.

The purchase of two pumps for the Glass street sewage disposal plant, at Bridgeton, N. J., has been ordered.

The reported addition to the Saurer plant of the International Motor Company, at Plainfield, N. J., will be of frame and cover about 12,000 sq. ft., to be used for storage. L. S. Ayer is superintendent.

The C. D. S. Tool & Specialty Company, 54 Cummings street, Irvington, N. J., has been incorporated with a capital stock of \$10,000, by Harry H. Picking, 525 Main street, East Orange, N. J.; Gordon Grant, and Charles O. Geyer. The company will continue business at its present address.

The Niagara Motor Boat Company, Sweeney street, North Tonawanda, N. Y., has awarded contract to Morris & Allen, Buffalo, N. Y., for the construction of a frame addition to its factory, to be completed by May 1. C. Robertson is secretary.

A building permit has been issued to the Eastern Grain, Mill & Elevator Corporation, Buffalo, for the erection of a reinforced concrete elevator and mill building on the Buffalo River and Lake Shore & Buffalo Creek Terminal Railroads to cost \$226,700.

An addition 30 x 78 ft., two stories, is to be made to the carriage and wagon works of C. J. Handel, Myrtle and Chicago streets, Buffalo.

The Mica Insulator Company, Schenectady, N. Y., is building an addition to its plant.

The Gabrielson Car Parts Mfg. Company, Jamestown, N. Y., has increased its capital stock from \$35,000 to \$100,000.

The plant and laboratories of the Babcock-Hagmaier Company, Ridge road, Lackawanna City (South Buffalo), N. Y., were destroyed by fire May 2.

The Niagara Electric Improvement Company, Buffalo, has been incorporated with a capitalization of \$50,000 to manufacture electric meters. The directors are S. Piek and L. C. Nicholson, Marine Bank Building, Buffalo, and R. C. Downing, Syracuse, N. Y.

The Cutler Desk Company, Buffalo, is building an addition 50 x 110 ft., one story, to its factory at Churchill street and the New York Central Railroad.

The Morrow Mfg. Company, Elmira, N. Y., has let the general contract to the Compton Realty Company for the erection of a one-story addition, 179 x 450 ft., to be made to its plant.

The Tri City Motor Company, Albany, N. Y., has increased its capital stock from \$10,000 to \$20,000.

New England

BOSTON, MASS., May 4, 1915.

The news floating about is almost bewildering, it is so full of great orders for war materials and the machinery to manufacture them. New plants are projected which will require much equipment; but where this machinery is coming from no one has any idea. The market is pretty well depleted. The builders cannot promise early deliveries of any of the machines that are required. Many machinery manufacturers have contracted with outside shops for their work. Any machine shop can book this profitable business, if it has not already done so; the present capacity of the works of those manufacturers whose machines can be used in making projectiles, small arms ammunition, and such firearms as are used in this war, has been taxed beyond the limit, and in spite of overtime and night shifts they have been compelled to ask the assistance of neighbors who have been less fortunate in the relation of their product to the exigencies of the market. The man who could furnish a moderately well equipped machine shop, or even one with machinery rather behind the times, would meet with a ready reception in many places. As for workmen, they are no longer seeking employment; they are being sought.

The Wyman & Gordon Company, Worcester, Mass., manufacturer of drop forgings, has increased its capital stock from \$300,000 to \$900,000 by the issue of \$450,000 of 7 per cent. preferred stock and \$150,000 of common stock. All of the stock held by the estate of Lyman F. Gordon has been purchased by other interests; but the control of the business remains with Worcester ownership. George F. Fuller, who has been connected with the company for 27 years, and who has been the general manager for 10 years, succeeds Mr. Gordon as president and treasurer; Harry G. Stoddard continues as vice-president and has been made general manager, and Charles C. Winn, who has had charge of the office for several years, becomes assistant treasurer and clerk of the corporation. The company will erect an administration building, and a building to increase the heat-treating department, in which will be concentrated the old as well as new equipment, releasing space for other manufacturing purposes.

One of the most important results of the war orders is the new plant which will be erected at Bridgeport, Conn., by a new corporation to be known as the Bridgeport Projectile Company. The works will consist of a main building 100 x 400 ft., a two-story forge shop 60 x 550 ft., a power plant 60 x 150 ft., and a building 50 x 100 ft., to be known as the accumulator department. All of these structures will be brick and steel, of fireproof construction. The personnel of the owners is not given out, but the contractors have an office in the Newfield Building, Bridgeport. The general understanding is that the works will be devoted practically exclusively to the manufacture of projectiles.

The report from Waterbury, Conn., on the plans of the Scovill Mfg. Company, brass manufacturer, is that an additional factory building will be erected, 200 x 600 ft.

The Waterbury Tool Company, Waterbury, Conn., has purchased land upon which it will construct a new factory.

The H. B. Smith Company, Westfield, Mass., manufacturer of heating appliances, has let the contract for a large addition to its machine shop.

The addition to the works of the New London Ship & Engine Company, New London, Conn., 40 x 80 ft., already announced, will be supplemented by a machine shop, pattern shop, pipe shop and storehouse.

Plans are completed for the addition to the works of the Hartford Machine Screw Company, branch of the Standard Screw Company. The building will be 50 x 206 ft., five stories. A part of it will be devoted to offices, with fireproof vaults.

The North & Judd Mfg. Company, New Britain, Conn., manufacturer of saddlery hardware, plans large extensions to its works. The present building will be raised two stories, and plans call for a six or seven-story addition in the rear of the plant.

Philadelphia

PHILADELPHIA, PA., May 3, 1915.

The Klauder-Weldon Dyeing Machine Company, Amsterdam, N. Y., is having plans drawn for a plant to be erected near Philadelphia. It will have a much larger capacity than the present one at Amsterdam. W. S. Duell is general manager.

Peuckert & Wunder, 310 Chestnut street, Philadelphia, will soon take bids for the construction of a one and two-story and basement factory, 100 x 190 ft., of brick and steel construction, for the Pangborn Corporation, Hagerstown, Md. A 10-ton electric crane is specified among the equipment.

Mellor & Meigs, architects, 205 South Juniper street, Philadelphia, have drawn plans for a two-story brick factory, 50 x 100 ft., to be erected for Samuel Yellin, 217 Jefferson street, Philadelphia.

J. B. Harman, Lancaster, Pa., is drawing plans for an addition to a factory, to be three stories, 40 x 100 ft., of brick construction, estimated to cost about \$10,000. Shafting and wood-working machinery, etc., will be required.

T. H. Hamilton, Patriot Building, Harrisburg, Pa., has drawn plans for a mill and warehouse, to be erected by the Boyd Estate. It will be of stone, three stories, 36 x 50 ft.

The York Haven Paper Company, York Haven, Pa., has started work on an addition to its acid plant to cost \$20,000.

Baltimore

BALTIMORE, MD., May 3, 1915.

The demand for skilled labor is on the increase in Baltimore and vicinity. The past week was a decided improvement in this line.

The Baltimore & Ohio Railroad Company is said to be considering the construction of a new steel coal pier of large dimensions at Curtis Bay, Md. It also is said that the company is considering other terminal improvements. Definite announcement is looked for in the near future.

Application has been made to the Public Service Commission by the Terminal Freezing & Heating Company, 408 to 430 South Eutaw street, Baltimore, for permission to issue \$125,000 in trust notes. It plans to enlarge and extend its plant.

A four-story warehouse is to be erected at 29 to 31 South Charles street. Joseph Schamberger, contractor, has purchased the property.

Simon Epstein, 115½ to 117 North Harrison street, Baltimore, plans to install a wood-working equipment and motors.

The Baltimore & Ohio Railroad Company is in the market

for a 60-ft. electric traveling gantry crane, for Georgetown, D. C.

A two-story factory, 62 x 120 ft., is being built at Spring Gardens by the Chesapeake Iron Works, which recently took over the Lauer & Harper Company, Westport, Md. It will also enlarge its office building and add an extra story.

Charles H. Tindall & Son, Wilmington, Del., has completed the erection of a two-story and basement machine shop, 50 x 80 ft., for the National Machine Company, 507 Orange street, Wilmington.

That the old Standard Arms Company plant, South Wilmington, Del., is to be taken over by an unnamed firm for the manufacture of time fuses, is rumored. It is said that the plant is not to be an adjunct of the Bethlehem Steel Company, which is building a projectile plant near New Castle, Del.

Announcement has been made that the Harlan & Hollingsworth Corporation, Wilmington, Del., has secured a contract for the construction of an oil tank steamer for the Mexican Oil Company, New York, which will cost about \$750,000.

The Krebs Pigment & Chemical Company, Newport, Del., is soliciting bids for the erection of an addition to its plant, two and three stories, 103 x 223 ft., of brick and reinforced concrete construction. The company is not at present ready to enter into further details of the proposed addition.

The Pulaski Foundry & Machine Company, Pulaski, Va., will build an addition to its plant, and will purchase a number of machine tools, including a 5-ft. radial drill.

The Charlottesville & Albemarle Railway Company, of which John L. Livers, Charlottesville, Va., is manager, will purchase a 200-kw. rotary converter.

The Lynchburg Traction & Light Company, Lynchburg, Va., will enlarge its Blackwater street power plant at a cost of \$85,000.

Chicago

CHICAGO, ILL., May 3, 1915.

While those tool builders who have been either direct or indirect beneficiaries of war orders, especially the makers of lathes, turret lathes and milling machines, are still busier by a large margin than other manufacturers, yet the amount of business on the books of all the shop equipment interests appears to have increased somewhat. A Western manufacturer of drills and horizontal boring mills reports a substantial gain in the past month with orders from domestic sources largely from the automobile builders. The buying of machine equipment for the making of ammunition included the placing of a large order in this market by the National Recording & Computing Company, Dayton, Ohio, for turret lathes and screw machines. The Foster Machine Company, Elkhart, Ind., has booked within a week orders to the amount of \$140,000, bringing the aggregate taken in the past several months up to more than \$800,000. To deliver the machines ordered this company will be compelled to operate night and day for a year. The Greenlee Brothers Company, Rockford, Ill., while it has as yet worked out no plans or policy in connection with the marketing of the turret lathe, the manufacture of which was recently taken over, is now building a lot of 25 machines, the order for which arose out of the special demand now prevailing. The company builds a 2 1/4 x 26-in. machine, but its line will probably be extended to include a 3-in. machine as well. In connection with recent railroad lists no purchases have been made as yet.

The Zouri Drawn Metals Company, 215 West Schiller street, Chicago, manufacturer of safety, key-set store fronts, is moving from that location to larger factory accommodations at Chicago Heights, Ill.

The Rich Tool Company, Railway Exchange Building, Chicago, with a plant at 2003 South Wood street, is turning out automobile motor valves at the rate of 8000 a day, operating up to the capacity of the works.

The Link-Belt Company, Chicago, which acquired some two years ago a piece of property on Thirty-ninth street opposite its present plant, is now preparing plans for the erection of a large addition to its manufacturing facilities.

The George W. Johnson Column Form Company, Chicago, has been organized by George W. Johnson, John F. Jurgenson and James R. Glass, 1224 Lunt avenue, to manufacture patent sheet metal forms for reinforced concrete columns. It has a capital of \$2500.

The Western Pump Supply Company, 119 North Desplaines street, Chicago, will erect a three-story warehouse on Fillmore street near Kedzie avenue, which will cost about \$60,000.

The A. E. McCallum Company, Chicago, has been incorporated with a capital stock of \$2500 to manufacture

machinery parts. The incorporators are Otto H. Rhein, Robert Doherty and A. E. McCallum, 920 Lafayette parkway.

The Al-Cool Fan Company, Chicago, has been organized, with a capital stock of \$5000, by H. E. Selve, Robert Bachrach and S. Sidney Stein, 108 South LaSalle street, to manufacture mechanical devices.

The Brosche & Kenlay Twentieth Century Injector & Supply Company, Danville, Ill., has been formed by Frank Brosche, John S. Kenlay, John J. Curry and W. C. Lewman to manufacture injectors, boiler and engine supplies.

The Electro-Pneumatic Skid Company, Centralia, Ill., has been organized with a capital stock of \$100,000, to manufacture machinery. The organizers are C. D. Claud, L. W. Wooley, J. W. Stansell and George Main.

Bids will be received until May 17, by Martin C. Schwab, consulting engineer, 1514 Mallers Building, Chicago, for an engine, stacks and accessories at the Elgin State Hospital, Elgin, Ill., and similar equipment for the Chicago State Hospital for the Insane, Dunning, Ill.

The Triple Tool Company, Jacksonville, Ill., has been incorporated with a capital stock of \$10,000 by Fletcher J. Blackburn, Edward Earl Goeheen and J. W. Walton to manufacture post-hole diggers, etc.

F. H. Cavett, Ryder, N. D., is contemplating putting in an electric light plant.

Gaylord, Kan., has voted \$7000 in bonds for a municipal electric light plant.

The city commissioners, Pratt, Kan., have let the contract for the construction of a lighting plant to the Connor Construction Company, Kansas City, Mo.

The Dubuque Boat & Boiler Company, Dubuque, Iowa, will build a one-story machine shop, 50 x 75 ft.

The initial step toward the construction of the Union Depot, St. Paul, Minn., has been taken by W. C. Armstrong, chief engineer in charge, and bridge engineer of the Chicago & Northwestern Railway, who has invited eighteen contractors to submit bids for the construction of the depot, including yard and river front changes, to cost about \$15,000,000.

St. Paul, Minn., has started the construction of a municipal garage, to be completed this summer.

La Junta, Col., has voted \$75,000 of municipal electric lighting plant bonds. S. W. Brown is city clerk.

Indianapolis

INDIANAPOLIS, IND., May 3, 1915.

The Special Machinery & Foundry Company, Martinsville, Ind., will erect two factory buildings, 100 ft. square, where it will manufacture special machines, canning machinery, small steam and gas engines, vacuum pumps, air compressors, etc. It is in the market for lathes, from 14 to 24 in., and other tools and machinery in proportion necessary to build the above machinery. It will mold iron up to castings of 500 lb., and also brass. It will manufacture wood and metal patterns, and will require the latest type of molding machines and other molding equipment. C. G. Chase is secretary.

Fire in the plant of the Premier Motor Mfg. Company, Indianapolis, April 24, caused a loss of \$50,000.

The Wilhelm Safety Air Hose Coupler Company, Michigan City, Ind., has been dissolved.

The Kokomo Welding Company, Kokomo, Ind., has been dissolved.

The Brooklyn Brick Company, Brooklyn, Ind., has increased its capital stock from \$50,000 to \$100,000.

The Vincennes Shale Brick Company, Vincennes, Ind., has been incorporated with \$40,000 capital stock to manufacture clay products. The directors are J. L. Klemeyer, H. B. Davis and W. M. Willmore.

The Bay State Coin Controlling Lock Company, Lebanon, Ind., has been dissolved.

The King Mfg. Company, North Vernon, Ind., has been incorporated with \$10,000 capital stock to manufacture seed cleaning machinery. N. M. and J. M. King, and E. E. Walker are the incorporators.

The Electric Machine Company, New Albany, Ind., has increased its capital stock from \$6000 to \$15,000.

The Hoosier Castings Company, Connersville, Ind., has been incorporated with \$35,000 capital stock by E. W. and F. B. Ansted and H. A. Wainwright to manufacture castings.

The Muncie Electric Light Company, Muncie, Ind., a subsidiary of the American Gas & Electric Company, has increased its capital stock from \$1,000,000 to \$1,400,000. Part of the increase will be spent for improvements.

The George T. Smith Company, South Bend, Ind., has

been incorporated with \$300,000 capital stock to manufacture machinery. The directors are George T. and Frank M. Smith and J. B. Sikes.

Bids will be taken until May 7 by T. Y. Richards, city clerk, East Chicago, Ind., for one centrifugal pump and foundations.

The Anderson Foundry & Machine Company, Anderson, Ind., is considering the erection of an additional building on the concrete foundation and floor which has been built for several months near its machine room.

The Remy Electric Company, Anderson, Ind., has completed an addition to its plant which will provide more space for the automatic and screw machine departments.

Marshall E. Van Arman, 624 State Life Building, Indianapolis, Ind., has prepared plans for a \$25,000 vocational school, two stories, requiring some manual training equipment.

Milwaukee

MILWAUKEE, WIS., May 3, 1915.

While April building figures in Milwaukee were about 10 per cent. less than for the corresponding period of 1914, the number of permits granted is higher. Good news has come to industrial circles in the announcement that the Ford Motor Company, Detroit, will establish a branch in Milwaukee, to cost \$300,000; and a motor-building interest has a five-year contract of considerable size, requiring the speedy completion of a new plant. Domestic requirements in general are in much larger volume than for a long time, and war business is beginning to take a back seat. The unemployed situation is greatly improved, particularly with regard to common labor, while skilled labor in many lines is hard to get. Numerous industries in the interior of Wisconsin are advertising in metropolitan dailies for expert help.

An automobile assembling plant costing \$300,000, employing from 400 to 500 men, and with an annual payroll of at least \$600,000 is contemplated in Milwaukee by the Ford Motor Company, Detroit, which has operated a small plant of this character in Milwaukee for two years in leased quarters. The Common Council is engaged in removing statutory restrictions interfering with the establishment of this plant on a selected site. According to A. W. L. Gilpin, manager of the Milwaukee branch of the Ford Company, plans for the proposed factory call for a seven-story reinforced concrete and brick building, 160 x 330 ft., with an annual capacity of 18,000 to 20,000 cars. This number will just about suffice to supply Wisconsin.

The Davis Mfg. Company, Fifteenth avenue and Park street, Milwaukee, manufacturer of gasoline motors, has closed a contract with the Railway Engineering & Equipment Company, Indianapolis, Ind., for the construction of the motors, trucks and underframes for the entire output of gasoline railroad coaches of the latter company for a period of five years, or until May 1, 1920. The average annual production is figured at 125, but the contract starts at 40 the first year and 300 the last year. The contract has been in view for more than a year, and partly to accommodate it the Davis Company started last summer to build a plant costing from \$175,000 to \$200,000 at West Allis, Wis. The work has been progressing slowly, but it will now be speeded up and finished without delay.

The Federal Malleable Company, 299-323 Sixty-fourth avenue, West Allis, Wis., is about to make important improvements which will require new equipment, particularly electric motors. Leenhouts & Guthrie, architects, close bids May 6 for the erection of a two-story brick and concrete pattern vault and office building, 50 x 70 ft. The Thomas S. Watson Company, consulting engineer, Majestic Building, is in charge of the new heating and wiring systems and the purchase of eight to 10 electric motors from 5 to 7½ hp.

The Federal Bridge Company, Waukesha, Wis., formerly the Modern Steel Structural Company, is developing a small farm tractor.

Bids for the construction of a central heat, light and power plant at Wyocena, Wis., will be received by H. R. Tongen, county clerk, Portage, Wis., until May 12. The work includes boilers, pumps, waterworks construction, etc. Allan D. Conover, Madison, Wis., is the engineer in charge.

The Power & Engineering Company, Minneapolis, Minn., has been engaged by the city of Shawano, Wis., to make plans and estimates for a new dam and hydroelectric plant on the Wolf River, to supplant the present steam plant, which will be used as an auxiliary. An investment of \$45,000 to \$50,000 is planned.

The Allis-Chalmers Mfg. Company, Milwaukee, has booked the second large pumping engine contract in two weeks' time. The city of Durham, N. C., has purchased a 30,000,000-gal.

engine for its municipal waterworks system. The city of Perth Amboy, N. J., has purchased a 12,000,000-gal. engine for its Runyon watershed.

The Feilbach Motor Company, Milwaukee, which established a motorcycle factory about four years ago, has dissolved as a corporation and retired from business.

The A. W. Schram Mfg. Company, manufacturer of chairs and hardware work, Oshkosh, Wis., has decided to relocate at Ladysmith, Wis., and has reorganized as the Schram Chair Company. A new four-story factory, 60 x 132 ft., of brick and mill construction, will be erected at once. O. J. Smith is general manager.

The Drew Carrier Company, Waterloo, Wis., litter carriers, vehicles, barn equipment, etc., has disposed of its vehicle business to the Waterloo Novelty Company, recently incorporated with \$10,000 capital by G. F. Nisle and J. E. Alling. The new company has leased the second floor of the Drew shop for factory purposes until it is decided to build a separate plant. The Drew Company will manufacture only litter carriers and stanchions.

The Wisconsin Seating Company, New London, Wis., which recently developed and entered into a large production of a practically all-steel theater chair, has organized this part of the business as the Movie Chair Company. A large addition is being completed.

Otto E. Schmidt, doing business as Otto E. Schmidt Belt-
ing & Rubber Company, 138 West Water street, Milwaukee, has filed a voluntary petition in bankruptcy, scheduling liabilities at \$13,378 and assets at \$8285.

Garages with repair shops in connection, will be erected in Wisconsin as follows: Grand Rapids, Wis., J. A. Cohen, for Kampe & Schill, \$10,000; Dodgeville, Wis., George Elvold; Kendall, Wis., Miller & Waters, \$4500; Milwaukee, Midland Realty & Loan Company, West Water and Sycamore streets, \$12,000; Milwaukee, R. Grossenbach, Fifth street, near Center street, \$5000; Washburn, Wis., George Glacier, \$3500; Milwaukee, W. Schuett, Prospect and North avenues, \$15,000. The Weigand Garage, Merrill, Wis., and the Prouty Automobile Company, Richland Center, Wis., will build large additions.

The Wisconsin Public Utility Service Company is considering the construction of a \$300,000 hydro-electric plant at Johnson Falls this year.

John Weber, Waukesha, Wis., will open a garage and commercial machine shop, which will be operated by George Savage.

Detroit

DETROIT, MICH., May 3, 1915.

April was a very good month in the local machinery market, business in almost all lines of equipment showing a satisfactory increase. The last few days have been rather quiet, but dealers are inclined to believe that the slackening of activity is only temporary and are optimistic over the outlook. A fair volume of inquiries is before the trade. Conditions both in the automobile industry and the general metal trade field are good. A number of Detroit manufacturers have received fair-sized war orders, necessitating the purchase of additional equipment and some of these companies are obliged to operate their plants both day and night in order to take care of their regular trade in addition to their export business. Activity in the State is not so marked as in Detroit; but reports received indicate a general betterment of conditions. Building operations are about normal for this time of the year.

The Timken-Detroit Axle Company, Detroit, manufacturer of automobile axles, is adding a third story to its main manufacturing building, 45 x 200 ft., and will still further increase its capacity by the erection of a new building, two stories, 45 x 51 ft.

The University of Detroit, Detroit, has broken ground for the erection of a new engineering building to cost about \$30,000. It will be suitably equipped for machine shop and laboratory work.

The Standard Motor Parts Company, Detroit, has been incorporated by E. J. Dayton, Oscar Gumbinsky and W. S. Grant with \$300,000 capital stock to manufacture automobile parts and accessories.

The Wilson Foundry Company, Pontiac, Mich., is completing a large addition to its machine shop, 100 x 125 ft., and is installing a considerable amount of special equipment therein. A new core room, 70 x 100 ft., is now planned and the molding room will be enlarged also. The company reports a splendid volume of orders.

James Bradley, Pittsburgh, and others, will establish a foundry and machine shop at Muskegon, Mich., to manufacture cast-iron plumbers' and steamfitters' supplies. A

factory to cost about \$12,000 will be erected. P. P. Schnorbach, secretary of the Muskegon Chamber of Commerce, may be addressed for particulars.

The Furniture Shops Company, Grand Rapids, Mich., has been incorporated with \$100,000 capital stock by J. A. Rose, B. S. Warren and L. S. Wallace, and has purchased the plant and a portion of the machinery of the American Mfg. Company, Grand Rapids. The new company has not as yet announced its manufacturing plans.

The Benton Harbor Malleable Foundry Company, Benton Harbor, Mich., is erecting an addition to its plant, 60 x 160 ft. The new building will be used as a drop forge plant for the manufacture of forged steel parts. This is a new line for the company. It will require for its drop forge plant board hammers from 1500 to 3000 lb. capacity, trimming presses, vertical milling machines, planing machines, drill presses and other standard drop forge plant equipment. J. N. Klock is manager.

The Hoover Steel Ball Company, Ann Arbor, Mich., is building an addition to its plant.

The new plant of the Kuhlman Electric Company, Bay City, Mich., will be ready for the installation of the company's machinery by July 1.

Cleveland

CLEVELAND, OHIO, May 3, 1915.

Considerable machinery for making war material is still being placed and a good volume of inquiries continue to come out. Among the new inquiries is one for a large number of screw machines for export to Russia. A Dayton manufacturing company has purchased 20 cold saws, and other business was placed last week to cover requirements for making war material in Dayton. A good volume of business is coming from the automobile trade. Orders from this source include 10 lathes and two milling machines purchased by a Cleveland company and 12 multiple spindle drilling machines bought by another Ohio automobile builder. The scattered buying of one or two machines is holding up well. Local machine shops are very busy, owing to the large amount of jobbing work placed by automobile manufacturers.

The Van Dorn Iron Works Company, Cleveland, has increased its capital stock from \$150,000 to \$350,000 and will enlarge its plant by the erection of a new building, 100 x 200 ft. The addition will not be built for any particular department, but to provide additional capacity for any department that may need it. Considerable new equipment will be installed.

The W. M. Pattison Company, Cleveland, has purchased the entire machinery equipment of the Speedwell Motor Car Company, Dayton, Ohio, which recently went into the hands of a receiver.

The Shop Fabricated Reinforcing Company, Cleveland, has been incorporated with a capital stock of \$10,000 by M. K. & F. S. Beardslee, and others, to manufacture equipment for structural purposes.

The director of public service, Norwalk, Ohio, will receive bids May 13 for three 100-kw gas-engine-driven generators, exciters and piping for the municipal light plant. Specifications are also on file at the office of H. Whitford Jones & Co., consulting engineers, 130 Citizens Building, Cleveland, Ohio.

The Hotstream Heater Company, Cleveland, has been incorporated with a capital stock of \$10,000 by E. F. Allen, E. L. Mueller, and others, to manufacture heaters and gas appliances.

The Bryant Heater & Mfg. Company, Cleveland, maker of steam and hot water boilers, will erect a new plant at 952 East Seventy-second street, opposite its present quarters. The building will be three stories, of brick, steel and frame construction.

The Ohio Sheet Metal Company, Canton, Ohio, recently incorporated with a capital stock of \$50,000, will manufacture metal ceilings, steel lockers and other sheet-metal products. It will occupy the plant formerly used by the Canton Mfg. Company. Among those interested in the new company are J. H. Eller, William H. Gardner, who will be manager, and J. A. Jeffers.

The Gordon Rubber Company, Canton, Ohio, will enlarge its plant by the erection of two buildings, one for a tire department and the other for a sundry department.

The Western Automatic Machine & Screw Company, Elyria, Ohio, has placed contracts for the erection of a three-story brick and concrete plant extension, 42 x 100 ft.

The National Handle Company, Findlay, Ohio, will shortly begin the erection of a plant to replace one that was burned a few days ago. It is stated that some new wood-working machinery and other equipment will be required.

Contracts have been placed for a large building in Toledo,

Ohio, to be occupied by the International Harvester Company. This is to be five-stories, of brick, stone and steel, providing 70,000 sq. ft. of floor space.

The Libbey Glass Company, Toledo, Ohio, has commenced the erection of a two-story steel and brick experimental building, 60 x 140 ft.

W. E. Ferrell, town clerk, Lisbon, Ohio, will receive bids until May 7 for a steam-driven air compressor.

Cincinnati

CINCINNATI, OHIO, May 3, 1915.

Somewhat conflicting reports have been received from different machine-tool manufacturers. Several state that export business is very slow, while others have received recently very encouraging orders from both foreign and domestic sources. As has been the case for the past six months lathes are still leading, but a better demand for other types of machine tools is now encountered, including planing machines and radial drilling machines. A nearby machine-tool builder is very busy finishing 24 and 36-in. lathes for both domestic and foreign customers, and the comparatively large number of the latter-sized machines ordered is a matter of comment. Many are speculating as to what use will be made of these lathes. A few scattered railroad inquiries have been received; but no large lists are out. However, it is rumored that a manufacturer at Toledo, Ohio, is buying a large amount of equipment to fill an export order received from the Canadian Car & Foundry Company.

Several manufacturers in Dayton, Ohio, are making feverish preparations to execute a number of orders for shrapnel, and it is understood that more of this business is to be had, but the question of deliveries on time is in the way.

The local manufacturers of portable electric drilling and grinding machines are busy on orders both from domestic and foreign buyers. Second-hand machinery dealers are only doing a moderately fair business.

The Cincinnati Iron & Steel Company, Cincinnati, has just completed the erection of a warehouse on the Cincinnati, Hamilton & Dayton Railroad, near its lathe plant. This building was required on account of its increased machine tool business.

William Schott, Cincinnati, will establish a monument plant at Blue Rock and Spring Grove avenue, for which some special equipment will be required.

The Standard Marble Works, Cincinnati, contemplates making an extension to its plant on West Front street.

The Chicago Mill & Box Company, St. Barnard, Cincinnati, has been incorporated with \$250,000 capital stock by George Stugard, and others. It will erect a wood-working plant for which plans are now under way.

The Mercantile Corporation Company, New York, with branches in different cities, is reported to have had plans made for a printing plant to be erected at Dayton, Ohio.

The Dayton Metal Products Company, Dayton, Ohio, has been incorporated with \$200,000 capital stock, by Robert E. Cowden, and others. Nothing is known as to its manufacturing plans.

Work has been commenced on an addition to the plant of the Dayton Power & Light Company, Dayton, Ohio, that is estimated to cost \$150,000. Power plant equipment will be needed.

The Metal Label & Mfg. Company, Springfield, Ohio, has been incorporated with \$10,000 capital stock to manufacture metal specialties. Ralph E. Taylor is one of the incorporators.

The Rustler Mfg. Company, Springfield, Ohio, has been incorporated with \$250,000 capital stock to manufacture agricultural implements. Walter B. Smith is general manager.

The Corrugated Container Company, Columbus, Ohio, whose head office is located in New York City, has acquired one of the vacant buildings of the Columbus Buggy Company, and will fit it up for the manufacture of corrugated metal boxes.

It is rumored that the Victor Typewriter Company, New York City, is contemplating removing its plant to Columbus, Ohio.

The Minster Machine Company, Minster, Ohio, is making an addition to its plant that will be 65 x 120 ft., one story of mill construction.

Joseph Rebholz, Troy, Ohio, has let contract for a garage and repair shop.

The Ohio Valley Machine Works, Huntington, W. Va., has been incorporated with \$10,000 capital stock by W. W. Magoon, and others. It will operate a general machine shop.

The Standard Planing Mill Company, Ashland, Ky., is a

new incorporation with \$20,000 capital stock. Charles Kitchen is one of the incorporators.

An item in *The Iron Age* of April 29, regarding the "Belfast Iron Works Company," contained an unfortunate typographical error. The name should have been given as the Belfont Iron Works Company.

The Central South

LOUISVILLE, KY., May 3, 1915.

Business last month was well up to the expectations of manufacturers and dealers, and the current period is starting out well. The number of new industrial enterprises is increasing, and with manufacturers more inclined to spend money for plant improvements, the chances of the machinery concerns to get business are better. Motor manufacturers are finding the local market attractive at present on account of the number of companies which are changing from direct to alternating current. Boilers are in fair demand at present. Machine tools are moving better, largely to automobile repair shops; but the number of metal-working industries being established in this section is increasing. Woodworking equipment continues in good demand.

The J. V. Pilcher Mfg. Company, Louisville, will establish a plant in Canada this year. The company manufactures a metal specialty.

The Poole Mfg. Company, Louisville, has been incorporated with \$20,000 capital stock to manufacture a flexible metal boiler tube cleaner. The device is being made by contract at present, but the company will later establish a plant. E. H. Hilpp, care of the Kentucky Consumers Oil Company, is in charge.

The Snead Architectural Iron Works, Louisville, has let a contract to the James Clark, Jr., Electric Company for 10 alternating current motors with an aggregate of 175 hp.

The commissioner of fisheries, Washington, D. C., will receive bids until May 28 for the construction of certain sections of the pumphouse at the Louisville fishery.

The Anglo-American Mill Company, Owensboro, Ky., is in the market for the equipment for a 40-ton foundry. It is building an addition to its plant, and will start operations there in about six weeks.

The Palmer Hotel, Paducah, Ky., will install an ice machine with a capacity of 5 tons a day.

Stahel & Greis, Lexington, Ky., are reported to have plans for the establishment of a carriage factory.

The Wright Machine Company, Owensboro, Ky., has been incorporated with a capital stock of \$150,000, and will succeed to the business of the Gunther-Wright Machine Company, manufacturer of gas engines, excavating machines and wet dredging machines, equipped with both steam and oil engines. John S. Wright is president and general manager.

J. S. Cheak, Waddy, Ky., will build a flourmill to cost \$10,000.

The Kentucky-Jewell Coal Company, Hazard, Ky., is planning the installation of a motor-generator set.

The Limestone Lumber Company, Maysville, Ky., has taken over the business of the W. B. Mathews Lumber Company, and will improve the plant, installing additional wood-working equipment.

The Cumberland and Northern Railroad, Barbourville, Ky., which has been organized for the purpose of building a 25-mile railroad from Barbourville to Manchester, Ky., will build shops and will require other equipment.

J. R. Frank, Danville, Ky., is preparing to let a contract for the manufacture of a patented steel skid.

The Kentucky Southwestern Railway, Light & Power Company, Paducah, Ky., is now ready to begin the construction of its traction line from Paducah to Murray, Ky. It will establish a power-house, etc. H. C. Rhodes, Paducah, is president.

The People's Ice & Coal Company, Paris, Tenn., will increase the capacity of its ice factory from 15 to 25 tons a day at a cost of \$5000.

G. W. Killebrew, Nashville, Tenn., and others, are having plans prepared for a garage which will include automobile repair shops.

The Tracy City Auto Company, Tracy City, Ky., will equip an automobile repair shop and garage. W. J. Williams is secretary.

Edward Abele, Memphis, Tenn., is planning the construction of a garage, 50 x 100 ft., which will be equipped for repair work.

The Andrews Paper Box Company, Chattanooga, Tenn., will build an addition to its plant for the manufacture of trunks at a total cost of \$30,000.

H. J. Moore, Sweetwater, Tenn., is in the market for a triplex power pump with a capacity of 80 gal. per min.

Hessell Simmons & Co., Memphis, Tenn., are in the market for a second-hand 30-in. cabinet planing machine.

The Haskew Lumber Company, South Pittsburg, Tenn., will install wood-working machinery for the manufacture of handles.

The Naughton Grate Bar Company, Maryville, Tenn., is preparing to install machinery for the manufacture of metal corrugated culverts and will need riveting and bending equipment.

F. W. Harrison, Plainsville, Ohio, will establish a basket factory at Chattanooga, Tenn.

W. A. Frost, H. L. Wooley and J. R. Musgraves, Shelbyville, Tenn., will erect a steel frame garage which will be equipped for repair work.

The Johnson City Lumber & Mfg. Company, Johnson City, Tenn., incorporated with a capital stock of \$25,000, will erect three factory buildings, the largest 400 ft. long and containing 30,000 sq. ft. of floor space. The plant will be operated for the manufacture of vehicle materials, textile mill loom supplies, table rims, etc. T. B. Wallace, Greenville, S. C., is president; W. O. Nelson is vice-president and general manager, and W. S. Smith is superintendent, both of Johnson City.

Birmingham

BIRMINGHAM, ALA., May 3, 1915.

Better conditions in every line throughout Alabama and adjoining states are reflected in the machinery trade by a volume of inquiries which presages a decided increase in real business. The demands of the lumber trade for boilers, engines and pumps remain the feature; but the building of new cotton-seed oil mills, ice plants, water and electric lighting systems, together with a revival in the mining trade, has perceptibly stimulated the market. Buying has not increased to any great extent; but the feeling is decidedly better.

The Cookinet Cabinet Company, Birmingham, has been incorporated by H. C. Maynard, George L. Smith, and others, with a capital stock of \$5000, to manufacture a wooden device.

The Gadsden Cooperage Company, Gadsden, Ala., has been incorporated with a capital stock of \$10,000. It has purchased and will operate the plant of the Kyle Cooperage Company, manufacturer of barrels, etc. J. R. Raible is president.

The Alabama Cooperage Company, Montgomery, Ala., has been incorporated by W. Godfrey, Louisville, Ky.; J. N. Gibson, Decatur, Ala., and others, with a capital stock of \$1000.

The Alabama Decorative Stone Company, Birmingham, has been incorporated with a capital stock of \$360,000 by C. G. Kershaw, E. J. Goodwin, I. E. Mathis, and others. It plans to develop 80 acres of onyx and marble deposits.

The Farmers Flour & Mill Company, Marbury, Ala., incorporated with a capital stock of \$10,000, will build a flour, meal and grist mill. D. H. Marbury, W. B. Sims, and others, are interested.

The Lynnville Mill & Elevator Company, New Decatur, Ala., will rebuild its burned plant at a cost of \$75,000.

Jackson, Ala., will build an electric lighting plant.

Local representatives of Armour & Co., Birmingham, declare that the option on a site for a packing plant to cost \$500,000 has lapsed, and that plans are indefinitely postponed.

Robert Campbell and M. N. Landers, Gadsden, Ala., are interested in the proposition to establish a sanitary pipe plant on a tract of eight acres.

The G. F. & B. Chemical Company, Mobile, has been reorganized and its plant will be improved. It is one of three plants manufacturing shoe heels from scrap leather. A. C. Bruce, E. A. Stansbury, and others, are stockholders.

The Standard Brick Company, Athens, Ga., lately organized will continue operation of plant with a daily capacity of 60,000 brick. Billups Phinizy is president.

Southern Cotton Oil Company, Athens, Ga., will probably rebuild its plant lately destroyed by fire at a loss of \$125,000. J. B. Wier is manager.

F. L. Dickey, Kansas City, Mo., has purchased the entire capital stock of the R. B. Small Company, Columbus, Ga., manufacturer of sewer and railroad culvert pipe, partition tile, etc., and will later on make improvements. J. E. Minter, Columbus, is general manager.

An ice plant to cost \$50,000 will be built at Columbia, Tenn., by W. J. Rushton, and others, of the Birmingham Ice Company, Birmingham. They are also building a refrigerating plant in Birmingham at a cost of \$75,000.

The Gas Engine & Electric Company, 174 King street, Charleston, S. C., has been incorporated with a capital stock of \$6000 by H. Stevens White, A. D. Wall and J. M. Frampton, to deal in engine and service station equipment, etc.

St. Louis

ST. LOUIS, Mo., May 3, 1915.

Another week has passed of slow progress in the machine-tool trade by the dealers, but optimism due to the generally good trade and agricultural reports from St. Louis territory persists. Conditions in the money market, which are accepted as auguring increased investments on capital account as the season progresses, remain favorable. The reports of new corporations increase in number, and this is also taken as indicating a growing activity. Such business as is moving is of the single-tool type and mostly on replacement work. The only transaction of recent moment has been the purchase by the St. Louis Board of Education of a large amount of wood-working and metal-working equipment for the manual training department of a new high school. Second-hand tools are rather slow. Collections are satisfactory.

The Ballman Whitten Mfg. Company, St. Louis, Mo., has been incorporated with a capital stock of \$10,000 by Edwin C. Ballman, Stahl A. Whitten and Emil Doerr to manufacture automobile and engine appliances.

The Sweeney Tractor Company, Kansas City, Mo., has been incorporated with a capital stock of \$15,000 by George E. Ricker, E. J. Sweeney, and others to manufacture traction machinery.

The contract has been let for a new building to be occupied by the St. Louis Paper Can & Tube Company, St. Louis, Mo., which will move and enlarge its equipment when the building is completed.

Equipment for the conversion of raw leaf fiber into commercial product is wanted by the Charles R. Fife Company, Central National Bank Building, St. Louis, Mo., which is now in the market.

The Alpine Ice Company, Kansas City, Mo., has been incorporated with a capital stock of \$100,000 by John Clinger, C. M. Beasley and R. M. McCandlish, and will install ice-making machinery.

The E. J. Robinson Adjustable Bed & Sanitary Couch Mfg. Company, St. Joseph, Mo., has been incorporated with a capital stock of \$100,000 by E. J. Robinson, Perry Ennycart and A. H. Mitchell to manufacture patented metal beds, etc.

The Urich Electric Light & Power Company, Urich, Mo., will install an electric light and power plant. The machinery will cost about \$5000.

The Crystal Ice & Bottling Company, Crocker, Mo., will install an ice-making plant with about 10 tons daily capacity.

The report that the Lead Hill Machine & Foundry Company, Springfield, Mo., manufacturer of wood planers, drills, castings, etc., is in the market for equipment for a plant to be constructed is incorrect. It is contemplating removing its business to Arcadia Fla., in which case it will use its present equipment.

The Missouri School for the Deaf, Fulton, Mo., will install additional steam plant equipment. M. F. Bell, Fulton, is the architect in charge.

The Chicago & Alton Railroad, under the direction of chief engineer H. T. Douglas, Chicago, will increase the capacity and equipment of its grain elevator at Kansas City, Mo., from 250,000 to 1,000,000 bu.

The Prairie Grove Electric Company, Prairie Grove, Ark., of which J. H. Zellner is president, will install electric light plant equipment including two oil engines, one 50-kw., three-phase, 2300-volt generator, three 7½-kw. transformers, etc. Mack Thompson is the engineer in charge.

About \$60,000 is to be expended for equipment for a waterworks plant at Harrison, Ark. Albert C. Moore, Joplin, Mo., in the engineer in charge.

A. B. and C. B. Johnson will equip a waterworks plant at Marshall, Ark., the capacity being as yet undetermined. They are seeking equipment and designs.

The Coleman Oil Products Company, Tulsa, Okla., will install equipment for the manufacture of miscellaneous oils and petroleum products.

The Oklahoma Iron Works, Tulsa, Okla., will put in foundations this year for an additional building, 74 x 200 ft. and a warehouse, 40 x 100 ft., to be erected next year. No machinery will be purchased this season. A. B. Patterson is the engineer in charge.

The Corken-Hooton Machinery Company, 213 West First street, Oklahoma City, Okla., has been incorporated with \$6000 capital stock to deal in machinery. O. K. Corken is president; W. L. Hutcheson, vice-president, and C. A. Hooton is secretary and treasurer. It does not plan to manufacture machinery, as has been reported.

The Tulsa Asphalt & Mining Company, Tulsa, Okla., has been incorporated with a capital stock of \$250,000 by S. B. Longfellow, Tulsa; S. H. Longfellow, Ochelata, and others,

and will install asphalt mining and manufacturing equipment.

The Jones Vaporizer Company, Altus, Okla., has been incorporated with a capital stock of \$13,000 by A. H. Jackson, A. M. Jackman, and others, and will equip a manufacturing plant.

The city of Boswell, Okla., will receive bids until May 14 for equipment for a waterworks plant, including a 100-hp. oil engine and other machinery.

The city of Cushing, Okla., will expend about \$100,000 in the improvement and extension of its waterworks plant, pumping system, etc.

The Sunflower Lumber Company, Clarksdale, Miss., will rebuild its sawmill, recently burned. About \$3000 of machinery is required.

The Baton Rouge Electric Company, Baton Rouge, La., of which Dobald Stewart is manager, will equip a power plant to cost about \$200,000 to replace its present station. Three 500-kw. turbines, three 400-hp. boilers, etc., will be required.

The American Sheet Metal Works, New Orleans, La., will equip a plant to manufacture sheet metal for buildings, etc. Gilbert Durand is president, and George Koehler secretary.

The Louisiana Fiber Board Company, Bogalusa, La., will install machinery to cost about \$100,000.

Morgan's Louisiana & Texas Railroad & Steamship Company will equip repair shops at Algiers Station, La. E. B. Cushing, Houston, Texas, is the engineer in charge.

The sewerage and water board, New Orleans, La., of which F. S. Shields, City Hall Annex, is secretary, will extend a pumping station now operating, expending about \$45,000 for machinery.

Texas

AUSTIN, TEXAS, May 1, 1915.

Trade conditions are excellent. The demand for oil well drilling machinery and equipment is increasing. Many companies are being organized to carry on the work of oil exploration and exploitation. The small tool trade is showing a steady improvement.

T. J. O'Donnell, Sweetwater, and W. L. Carwile, Dallas, are promoting the construction of a railroad between Midland and Lamesa, a distance of about 55 miles. For a bonus of \$250,000 they offer to locate the shops of the proposed road at Midland.

The Nogales Gas & Electric Light Company, Nogales, Ariz., is arranging to extend its power facilities into a big part of the territory in that part of Arizona and Mexico. It is erecting a new plant at a cost of \$150,000.

The Reese-Corriher Lumber Company, Henderson, is building a lumber mill of 35,000 ft. daily capacity. It will be equipped with the latest type of machinery.

Robert Galbreath, Tulsa, Okla., is promoting the organization of a company to construct an iron and steel mill in the iron ore region of Johnson County, Okla.

The Henderson Cotton Oil & Light Company, Henderson, will make extensive improvements to its plant.

The Rotary Valve Engine Company, Ft. Worth, has been organized with a capital stock of \$25,000. Samuel Davidson is one of the incorporators.

The Pacific Northwest

SEATTLE, WASH., April 27, 1915.

A gradual improvement is noted in the machinery trade. General business is hampered somewhat by high rates and scarcity of ocean tonnage, and a large amount of export cargo is piling up at Pacific ports awaiting shipment. This condition is emphasized by the heavy shipments of tractors, aeroplanes, etc., passing through Puget Sound for Vladivostok, in addition to the normal movement of implements and machinery for the Orient. As for machine tools, some tentative inquiries of a more important nature are beginning to appear, and small business is fully holding its own.

Notwithstanding the present unsettled conditions, there are increasing indications of a marked revival in prospect for the north Pacific States and Alaska. Interest in the latter territory is greatly augmented by the near prospect of Government railroad construction. For the present high prices for copper and spelter are causing activity in mining, and a lot of new equipment is being bought; while extensive preparations are being made to increase grain-handling facilities and flour production in this district. Implement manufacturers are extremely busy, and are making some improvements. The market for agricultural machinery of many kinds is expanding rapidly.

The Tacoma Central Heating Company, Tacoma, Wash., proposes to build a central heating plant at a cost of \$250,000, and has made a proposition to furnish steam for a 6000-hp. turbine generator plant for the city, which will supply its own generators, estimated to cost between \$50,000 and \$100,000. Bids will be taken for this machinery in the near future.

Ellensburg, Wash., has rejected all bids received for constructing a municipal light and power plant. New bids will be received until May 14 by Rueben Crimp, city clerk. The bids will be received on a unit basis, and the plant will cost approximately \$60,000.

The Carstens Packing Company, Spokane, Wash., has announced through Thomas Carstens, president, that improvements in addition to those announced will be made to its plant at a cost of about \$10,000.

W. F. Jensen, Salt Lake City, who operates creameries in many Western States, is forming a corporation, capitalized at \$3,000,000, to be known as the Mutual Creamery Company. It plans to locate creameries in large cities.

The Boise Valley Packing Company, Eagle, Idaho, recently filed articles of incorporation with a capitalization of \$20,000. The company plans the immediate erection of a packing plant at Eagle, Idaho, to be completed by this fall. C. F. Rowe, Boise, is general manager.

The Washington Water Power Company, Tekoa, Wash., will rebuild the local lighting system. The plant will be enlarged and some machinery added.

The Graphine Mfg. Company, Seattle, has been incorporated for \$50,000 by Edward J. Duffy, J. Y. C. Kellogg and Francis Holcomb. It plans the erection of a plant for the manufacture of grease and oil products.

The Shady Brook Milling Company, of Walla Walla, has been incorporated for \$100,000 by John Bachtold, E. O. Powers, R. D. Myers, Frederick Mottet and Nicholas Wierk. It will erect a plant for the manufacture of farm products.

Orders have been placed for a 60-ton Shaw electric ladle crane and a 7½-ton crane to go over the rolls, for the new plant of the Pacific Coast Steel Company, near Seattle. This company expects to have its plant in operation before the end of the year, with an initial annual capacity of 40,000 tons of open-hearth steel.

The Pacific Ice Machine & Supply Company has been incorporated at Olympia, Wash., with a capital stock of \$10,000 by A. H. and Elizabeth Brant and C. A. Moon.

The Gross Rotary Shovel Company, Idaho Falls, Idaho, has been incorporated with a capital of \$100,000 by W. M. Gross, F. C. Bowman and H. J. Brace to manufacture a patented rotary shovel for excavating.

Eastern Canada

TORONTO, ONT., May 3, 1915.

The steel companies of Canada appear to be now operating at about 60 per cent. of capacity. This is in part due to war orders on which they are all engaged, as the improvement in general trade is not very marked. Good business they do not expect until the railroads and manufacturers of agricultural implements come into the market more freely for supplies. Agricultural implement manufacturers do not, however, expect to operate their factories much more freely than at present until August assures a good crop in the West. In the meantime the plant of the International Harvester Company at Hamilton, Ont., is to close down temporarily, throwing 1000 men out of employment.

The manufacturers working on shells and other munitions of war are increasingly busy, a great many of them running their factories day and night. According to a statement issued by the Minister of Militia April 28, the orders so far placed in Canada for shells, explosives, etc., have a total value of \$175,000,000, and the value of the aggregate daily output is \$500,000. The same authority states that arrangements have been made to refine in Canada the copper and zinc and to manufacture brass to be used in the production of shells.

The Algoma Steel Corporation, Sault Ste. Marie, Ont., is to install a plant for the manufacture of toluol.

The Waterous Engine Works Company, Ltd., Brantford, Ont., is to install a plant for the manufacture of shrapnel shells.

The Canadian Brakeshoe Company, Ltd., and the MacKinnon, Holmes Company, Ltd., Montreal, have received orders for the manufacture of shrapnel shells and will install new machinery.

H. H. Vaughan and G. H. Duggan have organized the Montreal Ammunition Company, Ltd., Montreal, to manufacture shrapnel and high explosive shells. The former is president and the latter vice-president and general manager.

Hydro-Electric Radiation, Ltd., Toronto, has been incorporated with a capital stock of \$500,000 to manufacture radiators, stoves, ranges, boilers, etc. John Templeton, George E. Harrison, Harry C. Long, and John McDonald, all of Toronto, are the incorporators.

Camwick Lumber Company, Ltd., Montreal, has been incorporated with a capital stock of \$50,000 to operate sawmills, etc. George L. Alexander, Ernest Lafontaine, Henry J. Murphy, Herbert Hughes, and George Burnett, all of Montreal, are the incorporators.

The factory of the Canadian Machine Telephone Company, Ltd., 18-20 Duncan street, Toronto, was set on fire by lightning April 25 and damaged to the extent of \$40,000.

A. S. Wright's flourmill at Ridgetown, Ont., has been destroyed by fire with a loss of \$30,000.

Part of the \$100,000 bond issue of the Nova Scotia Clay Works, Ltd., Halifax, is to be devoted to the construction of a plant at Elmsdale.

Brockville, Ont., will receive tenders up to May 17 for the construction of a mechanical filtration plant. G. S. Bryson is town engineer.

Darling & Pearson, Toronto, are preparing plans for a new Canadian Pacific Railway union station at North Toronto to cost about \$800,000.

The Corn Products Refining Company, Jersey City, N. J., is to erect a plant either at Toronto or Hamilton, Ont., with a daily capacity of 15,000 tons.

Henry T. Swan's saw and planing mill at Tweedside, N. B., has been destroyed by fire.

Orillia, Ont., is to install a pumping plant which will include centrifugal pumps, electric motors, electrical equipment, etc. F. Gover is secretary of the local commission.

A company has been formed at Aurora, Ont., under the style of Office Bureau, Ltd., to manufacture furniture and fixtures. The capital stock is \$250,000. The provisional directors are William P. and Charles G. Gillespie, F. K. Fish, and Harry Melville, all of Toronto, and Hubert C. French, Windsor, Ont.

Western Canada

WINNIPEG, MAN., April 30, 1915.

General quietness in the industrial situation throughout Western Canada continues to retard the machinery business. Manufacturers and wholesale merchants, however, express confidence in the outlook. They expect some improvement in the coming weeks, although they admit trade is not likely to be as good as in previous corresponding seasons. Demand for tools and machinery parts this week was fair. Sawmill plants have recently been starting work, and many of them are fairly liberal buyers of small lots of miscellaneous equipment. Flour mills are not very busy at present, and there is not much trade in their line of machinery.

The Weist Grain Company, Ltd., Cardstadt, Alberta, will start about June 1 to build a grain elevator of 30,000 bu. capacity.

The Brackman-Ker Milling Company Ltd., New Westminster, B. C., are beginning the construction of a grain elevator and warehouse to cost about \$50,000.

Eaton Brothers, Reston, Man., have let a contract for the construction of a machine shop to Arthur Bushley, of that town. The equipment required has not been announced.

Government Purchases

WASHINGTON, D. C., May 3, 1915.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until May 25, schedule 8252, one air compressor for Washington; schedule 8253, one automatic grinder, one band re-saw, one two-blade bandsaw, one bandsaw, one swing type cut-off saw, two hand trimmers, and miscellaneous pulleys, all for Brooklyn; schedule 8254, one steam drop hammer for Norfolk; schedule 8255, two heavy-duty engine lathes for Charleston, S. C., and schedule 8256, two forced draft blower sets, for Boston.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, April 27, schedule 8118, class 49, for one lathe for Portsmouth, Va., as follows: E. L. Fraser, \$113*; Carl Koch, \$1044.35, \$940 and \$694.50; Manning, Maxwell & Moore, \$1180 and \$1135; Niles-Bement-Pond Company, \$1112; D. Nasl Machinery Company, \$920; Sherritt & Stoer, Inc., \$1149.

The purchasing officer of the Panama Canal, Washington, D. C., will receive bids until May 13, under canal circular 920, class 9, for two transformers and class 10, for three direct-current generators; until May 20, canal circular 923, class 5, for two centrifugal sewage pumps of 3350 gal. per min. capacity, and one centrifugal fire pump of 700 gal. per min. capacity, with accessories.

*Evidently an error in the Government Advertiser.

Trade Publications

Ball Bearings.—New Departure Mfg. Company, Bristol, Conn. Pamphlet. Contains a comprehensive and non-technical discussion of the use and value of ball bearings. This is supplemented by detailed descriptions of the four types of bearing made by this company and tables of specifications for the various bearings that can be supplied. Mention is also made of some of the precautions observed in the manufacture of the bearings with illustrations of the different precision instruments used.

Gravity Spiral Conveyors.—Otis Elevator Company, Eleventh avenue and Twenty-sixth street, New York City. Booklet. Describes and illustrates a line of gravity spiral conveyors for lowering packaged merchandise and boxed, cased, bagged and barrelled goods from the upper floors of a factory to the shipping and sorting rooms on the lower floors. These conveyors are of either the closed or open type, with from one to three spirals. Diagrams showing typical layouts of the conveyors are given, and there are illustrated descriptions of typical systems used in various lines of business. In addition to discharging material at the bottom of the conveyor, it is possible by the use of switchout plates to divert the packages to any intermediate floor, and as an adjunct to the regular long-run conveyor short spirals can be used for serving adjacent floors.

Return Tubular Boilers.—E. Keeler Company, Williamsport, Pa. Catalogue. Illustrates a line of return tubular boilers as installed in a number of power plants. The details of construction are described and the text is supplemented by a number of engravings of various features. Mention is made of the castings and fixtures used in connection with the boiler. Specifications for setting return tubular boilers are presented together with a table of dimensions.

Gears and Pinions.—Van Dorn & Dutton Company, Cleveland, Ohio. Bulletin No. 250. Calls attention to a line of hardened and heat-treated motor gears and pinions for electric railway, mill and mining service. Several designs of solid gears made from steel castings, forged or rolled steel, cast-steel split gears and hammered or forged-steel pinions are illustrated. Reference is made to the fact that a special process of hardening is used to secure maximum wear and strength, the wearing surface being converted into tool steel to give long wear. The core is toughened to provide strength, a special process of heat treatment being used to refine and toughen the steel with a view to reducing breakage to a minimum.

Concrete Construction.—Vulcanite Portland Cement Company, Philadelphia, Pa. Folder. Presents practical ideas in forms for the construction of concrete walls, tanks, posts, chimneys, slabs, etc. It is designed for the builder who plans and does his own construction work, and contains numerous drawings of the forms with the different dimensions marked.

Brass Castings.—Indianapolis Brass Company, 1012 East Michigan street, Indianapolis, Ind. Folder. Presents a brief summary of the company's facilities to handle light and medium machine-made castings for automobiles and automobile accessories, general jobbing castings and bronze sleeve bushings. Types of the various castings are illustrated.

Oxy-Acetylene Welders.—Searchlight Company, Karpen Building, Chicago, Ill. Instruction book. Describes, illustrates and gives instructions for setting up and operating Searchlight welders. Drawings showing the arrangement of the pieces for various welds are included.

Air Compressors.—Chicago Pneumatic Tool Company, Fisher Building, Chicago, Ill. Bulletin No. 34-M. Covers a line of steam and power driven air compressors, a feature of which is the elimination of all air valve gearing due to the employment of the special inlet and discharge valves of the flat disk type. The description is supplemented by numerous illustrations of parts, showing construction, method of operation and regulation. Tables of specifications and views of several different styles of compressors are included.

Demand Indicators.—Ft. Wayne Electric Works of General Electric Company, Ft. Wayne, Ind. Bulletins Nos. 46,100 and 46,101 (Nos. 1151 and 1152 old series). The first explains the construction and operation of type M demand indicator designed for use under the cost-to-serve system. In addition to the register of the ordinary watthour meter, it indicates the measured maximum demand during any interval. The second deals with type P which differs from the other in that it automatically records the energy consumption and the time of day at which the various amounts of energy were consumed.

Screw Machine Products.—Perry-Fay Mfg. Company, Elyria, Ohio. Booklet. Contains a collection of cuts of parts

intended to give some idea of the scope of the work of the company and the character of its products. The manufacture of automobile parts, such as piston pins, studs and spring bolts, castellated nuts, clevis pins, etc., is specialized in.

Threading and Cutting Tools.—Borden Company, Warren, Ohio. Catalogue and folder No. 40. Explain and illustrate the construction and operation of Beaver, Beaverette, Ohio and Warren die stocks and Beaver square-end pipe cutters featuring especially the narrow receding die and the Beaver cross-bar die stock. This last automatically releases the pipe after the die is cut. A numbered list of repair parts is included.

Slide Rule.—E. P. Johnson Rule Mfg. Company, 565 Washington boulevard, Chicago, Ill. Pamphlet. Explains by diagrams the method of using a slide rule for adding and subtracting fractions of the inch.

Ignition Metal.—Ellsworth Haring, 114 Liberty street, New York City. Circular. Gives a price list for this metal which is claimed to be a perfect substitute for platinum for spark points and all purposes requiring non-corrodible contacts.

Mine Ties.—Cambria Steel Company, Johnstown, Pa. Booklet. Describes the Slick steel tie for mine and industrial railroads, patents for which have been granted to E. E. Slick, vice-president and general manager. Illustrations are given in the booklet of the tie in different kinds of service, and the point is made that it is thin, and gives 2½ to 3 in. additional headroom in coal mines, thus enabling the men to load the cars with coal with greater ease and to put more in the car. Other advantages claimed for the tie are a lighter weight and the taking up of about only one-sixth the room required by wooden ties, as well as lying flat on the ground or floor, so that the men or mules cannot stumble over them. Full size drawings and tables of dimensions and weights of the ties are also given.

Precision Bench Lathes.—Stark Tool Company, Waltham, Mass. Catalogue. Deals with a line of precision bench lathes which are made in a number of different sizes, milling machines, pinion cutters and accessories. All of the various machines are illustrated and a description is presented in English, French, German and Spanish.

Hydraulic Pumps and Valves.—Hydraulic Press Mfg. Company, Mt. Gilead, Ohio. Bulletin No. 5000. Refers briefly to an extensive line of hydraulic pumps, valves and fittings. In connection with the pumps views and brief statements of the capacities of the various types are presented. The line of pumps shown ranges from hand-operated single-plunger pump with a maximum capacity of 1.22 gal. per min. against a pressure of 1200 lb. up to pumps of the vertical triplex type for pressures up to 15,400 lb. There is no descriptive matter used to supplement the illustrations of the valves and fittings. Among the valves shown is a pilot operated poppet operating valve which was illustrated in *The Iron Age* July 16, 1914.

Metal Sheets and Roofing.—Brown-Wales Company, C. Fargo and Egmont streets, Boston, Mass. Pamphlet entitled "A Handbook of Fireproof Building Materials." Illustrates and describes fireproof building materials of various kinds, such as metal sheets and roofing, conductor pipe, metal siding and shingles, ventilators, metal lath, screw anchors, washers, bolts, and nuts. Instructions on the application of some of the lines are presented, and tables of the sizes of bolts, nuts and washers that are regularly carried in stock are included.

Machinists' Tools.—Morse Twist Drill & Machine Company, New Bedford, Mass. Catalogue. This is the company's 1915 catalogue, describing and illustrating a line of machinists' tools, including increase and constant angle twist drills, reamers, chucks, milling cutters, taps, dies, wrenches, etc. For the most part the description is confined to the use of tables of the various sizes of each tool that can be supplied. Considerable useful information on the various tools covered by the catalogue and general miscellaneous information is included in an appendix.

Gun and Projectile Making Machinery.—Niles-Bement-Pond Company, 111 Broadway, New York City. Progress Reporter No. 26. Illustrations and descriptive matter explain the operation of various machines for making guns and projectiles. These include projectile turning and boring lathes and presses; rifling, drilling, milling, planing and slotting machines and boring mills. A number of views of the machines in actual use are included.

Fuel Economizers.—Improved Equipment Company, 60 Wall street, New York City. Pamphlet. Presents illustrations of an installation of bench fuel economizers made at the Point Breeze works of the United Gas Improvement Company, Philadelphia. The engravings show the work as it progressed and are supplemented by a brief text description of the various features.